5-2015

# An analysis of the effects of financial education on financial literacy and financial behaviors

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# AN ANALYSIS OF THE EFFECTS OF FINANCIAL EDUCATION ON FINANCIAL LITERACY AND FINANCIAL BEHAVIORS

by

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A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Economics

Under the Supervision of Professor William B. Walstad

Lincoln, Nebraska

May 2015





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P.O. Box 1346
Ann Arbor, MI 48106 - 1346

# AN ANALYSIS OF THE EFFECTS OF FINANCIAL EDUCATION ON FINANCIAL LITERACY AND FINANCIAL BEHAVIORS

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University of Nebraska, 2015

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This study estimates how financial education affects a person's financial literacy score, short-term financial behaviors, and long-term financial behaviors using data from the 2012 National Financial Capability Study (NFCS). There are seven categories of financial education—high school, college, employer, high school and college, high school and employer, college and employer, and combinations of all three courses—to estimate the effectiveness of financial education. This course detail has not been studied in previous literature about financial education.

Financial education has a positive relationship with a person's financial literacy score. Splitting the sample into groups based on education and income results show that people with low education and income have larger course coefficients compared to people with high education and income.

Financial education has mixed effects on short-term behaviors. These behaviors have almost immediate feedback, such as added interest charges from not paying off a credit card in full that month. Financial education may be less effective for short-term behaviors because people are able to learn about them through life experience and their understanding may depend less on formal instruction. There are, however, positive effects of financial education for short-term behaviors for people with low education and

income, suggesting that financial education is effective for people who may need formal instruction to learn the basic short-term behaviors.

Financial education appears to have a positive effect on long-term behaviors. These behaviors do not have immediate feedback. For example, retiring happens many years in the future and if a person incorrectly estimates how much they need or does not save at all, there is no way to fix this mistake. The long-term behaviors are less susceptible to learning through experience and therefore may be influenced with formal instruction.

The findings suggest that there are benefits to financial education, but the extent of the benefits may depend on the time horizon for changing financial behaviors. These findings will aid financial education programs. Financial education has the most positive relationship with financial literacy and long-term behaviors and a mixed relationship with short-term behaviors. Another key finding from this research is that people with low levels of financial literacy seem to benefit more.

Acknowledgements

Thank you to everyone who contributed to my success at the University of Nebraska–Lincoln during my Ph.D. studies. Thank you, Professor William Walstad for working with me and providing guidance, support, and expertise throughout my studies. I appreciate all of the work you have done to help me develop as a researcher and instructor. Thank you also for your financial support through the Hay Fellowship this last year giving me time to focus and write this dissertation.

Thank you to the members of my committee, Professor Sam Allgood, Professor Mary McGarvey, and Professor Thomas Omer, for all of your guidance and support. The many comments and suggestions were invaluable throughout the writing process. Thank you, Jennifer Davidson for providing opportunities throughout my time at UNL to work with the Nebraska Council on Economic Education and for proofreading many documents over the years. Thank you to Mary Lynn Reiser and Dr. Tammie Fischer for also providing opportunities to work with both the UNO and UNL Centers for Economic Education.

My family was also instrumental throughout my education. Thank you to my parents Chris and Sue Volz and my brother Nicholas Volz for your love, support, and prayers throughout my entire life.

Finally, thank you to my husband, Colin Wagner, for standing next to me through my graduate career. Your love and support made it possible to keep going through the process to write this dissertation. Thank you.

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# Chapter 1: Introduction to the Study

The 2007-2009 financial crisis highlighted the fact that Americans are not equipped to make sound financial decisions. The problems that surfaced during the crisis included the difficulty of managing personal debt and student loans because borrowers may not understand the concept of interest and be able to calculate the true costs of their loans (Lusardi and Mitchell, 2014; Council for Economic Education, 2011, 2014; NASBE, 2006; Hopley, 2003). There were more foreclosures suggesting adults may not understand their mortgage terms or how much their loan may be costing them in interest (Lusardi and Mitchell, 2014). There were low saving rates during this period causing problems for people when faced with an emergency requiring ready access to funds (Lusardi and Mitchell, 2014; Bernheim, Garrett, and Maki, 2001; Vitt et al., 2005). Adults also engaged in poor credit card behaviors such as not paying off their credit cards in full each month (Borden et al., 2008). These credit problems could be attributed to a lack of budgeting, not understanding the interest costs, and poor long-term financial planning. Also, adults face a complex world which makes financial decision making even more complicated and may explain why there is a gap between ideal financial decisions and actual decisions by households (Martin, 2007). These widespread financial problems may be remedied if people were more financially literate.

Financial literacy is defined as "people's ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions" (Lusardi and Mitchell, 2014). Being financially literate is important for individuals to make sound financial decisions, both in the short-term and the long-term. It is also the case that communities and a national economy with informed and financially

literate consumers will have more stable and efficient markets (Braunstein and Welch, 2002; Bernanke, 2006). Being financially literate is now an important skill like reading, writing, and math that everyone needs to know in order to survive the complex financial world. Annamarie Lusardi, a prominent economist conducting research in financial literacy, notes that "…just as it was not possible to live in an industrialized society without print literacy…so it is not possible to live in today's world without being financially literate (CEE 2011)." Similarly, Nan Morrison, President and CEO of the Council for Economic Education (CEE) sees a need for increased financial education, even at a young age, and states that financial literacy is not a negotiable skill in today's world (Sloan, 2012).

The lack of financial literacy has stimulated the development and implementation of numerous educational programs aimed at increasing financial literacy. At the high school level many states are now incorporating personal finance standards, courses, or exams as a graduation requirement (CEE, 2011; CEE 2014). There are seminars and workshops dedicated to helping college students understand topics like credit cards (Borden et al., 2008) and investments (Volpe, Chen, and Pavlicko, 1996). There are also financial education programs for employees to help them with retirement decisions (Clark, Morrill, and Allen, 2012; Kim, 2008). Adults receive help with basic financial management in programs about banking, investment, and credit card use (Zhan, Anderson, and Scott, 2006).

Economists are interested in studying financial literacy and financial education. Informed consumers are more equipped to make better financial decisions that can have positive long-term effects on households. Even short-term effects of financial education

courses (such as increased short-term saving) can have long-term impacts on a person's lifetime consumption (Lusardi, Michaud, and Mitchell, 2013). Previous research suggest that there are four traditional approaches to financial education—employer-based, school-based, credit counseling, or community-based—all of which do not have clear results about their effectiveness (Gale and Levine, 2010). Therefore, although financial education is often viewed as the most direct way to increase financial literacy, there is a need to evaluate the effectiveness of this approach because financial education is costly in terms of time and money. Extensive reviews of the research literature also note that there is limited evidence showing the effectiveness of financial education (Lusardi and Mitchell, 2014). More research needs to address this this gap in existing literature.

## 1.1 Purpose and Expectations

The main goal of this dissertation is to evaluate the effectiveness of financial education offered in high school, college, and through an employer. Financial education is studied three ways. The first essay estimates how financial education affects the financial literacy score of adults, ages 18 and older. This analysis evaluates whether financial education increases a person's knowledge about various financial topics. The second essay studies the effects of financial education on different short-term financial behaviors such as being able to cover their bills each month, having a checking account, and paying their credit card in full each month. Finally, the third essay estimates the effects of financial education on different long-term financial behaviors. Those behaviors include having an emergency fund, having a savings account, having non-retirement investments, figuring out how much they need for retirement, and having non-employer retirement accounts.

Financial education should increase financial knowledge and also help people behave differently, to make better financial decisions for themselves or their households. Hilgert, Hogarth, and Beverly (2003) suggest that financial behaviors may be hierarchal and that some behaviors may be more affected by financial knowledge. The authors split their behaviors into basic, short-term financial behaviors and more complex, long-term financial behaviors. Remund (2010) says that being financial literacy should not only include an understanding of key financial concepts but also include the ability to manage personal finances through short-term decisions and long-range planning. Thus there may be a time dimension to financial behavior that is worth investigating. It is a distinction that has not been directly addressed in the research literature on financial behavior.

This study will add to the literature by examining the effects of taking one or more financial education courses on a person's financial literacy and various financial behaviors. Typical research studies the population as a whole but certain groups of people may be more affected by financial education. Lusardi, Mitchell, and Curto (2010) find that even after controlling for demographic and family characteristics, college educated people are more financially literate than people with only a high school education. Also, Monticone (2010) finds that people with higher incomes are also more likely to be financially knowledgeable. Therefore, the people that have the lowest financial literacy scores—people with less education and income may be people that need financial education the most. Therefore, for this dissertation the population is split by education to see how financial education affects those with lower education (less than high school or high school graduates) and those with higher education (some college or college graduate). This research also estimates how financial education affects people

with low income (people making less than $50,000) and high income (people making more than $50,000).

Figure 1.1 shows the general pathway of financial education; for this research it is assumed that high school course is taken first, then a college course is taken, and finally an employer course. People could have taken a combination of any of the three courses. Therefore the course categories are: (1) high school, college, and employer course only; (2) high school and college course only; (3) high school and employer course only; (4) high school course only; (5) college and employer course only; (6) college course only; (7) employer course only; and (8) no financial education course.

[Figure 1.1: Financial Education Course Pathway]

Figure 1.2 shows the typical pathway of financial education for people with less than high school or a high school education. People with lower education, those with less than high school or a high school degree, could have only taken a financial education course in high school, through an employer, or both the high school and employer course. The first step of Figure 1.2 split people who took either a high school course or not. Then for each group the person could have taken an employer course or not. The course categories are: (1) high school and employer course; (2) high school course only; (3) employer course only; and (4) no financial education course. These are the distinctive categories in the analysis of people with lower education.

[Figure 1.2: Financial Education Course Pathway (Low Education)]

The hypothesis is that taking one or more financial education course(s) is related to higher financial literacy as measured by the number of correct responses to test questions. People who take financial education courses are going to be more likely to know about

the various financial topics and therefore should be able to answer the questions correctly.

For this research both short-term and long-term financial behaviors are studied. The short-term behaviors include: paying all of their bills, having a checking account, and paying off their credit card in full. These behaviors are considered short-term because people can receive immediate feedback from the behaviors. For example, if a person does not pay their credit card in full, the next month they will receive feedback about their negative behavior in the form of added interest to their credit card bills. The long-term behaviors analyzed in this study include: having an emergency fund, having a savings account, having non-retirement investments, figuring out how much they need for retirement, and having a non-employer retirement account. The behaviors are considered long-term because there is little or no immediate feedback. People generally have to figure out how much they need for retirement and plan over time to make sure they save enough for retirement. If they incorrectly calculate how much they need for retirement, or do not implement their saving plan, there is not really a chance to go back and remedy the problem. Therefore the long-term behaviors are behaviors that happen infrequently or have fewer opportunities to learn simply through experience.

Another hypothesis is that those who took one or more financial education course(s) are more likely to engage in the positive financial behaviors. People taking financial education course(s) are more likely to understand the costs of making poor financial decisions and should make more sound financial decisions for themselves and their households. Expanding upon this hypothesis, financial education is likely to be more effective for influencing long-term financial behaviors rather than the short-term financial

behaviors. The short-term behaviors may be learned-by-doing because people can quickly feel the negative effects from a financial decision and adjust their behaviors. The long-term effects are less likely to be learned by doing because the effects occur so far into the future, and there may not be an opportunity to try again. Therefore formal education is more important and necessary for the long-term behaviors.

## 1.2 Content Overview

Following this introductory chapter, Chapter 2 discusses the relevant research about financial literacy, financial education, and financial behaviors. The literature review splits the research into four financial education categories: (1) high school; (2) college; (3) employer; and (4) adult. There are few studies that study the three types of education together as this study does.

Chapter 3 is a detailed description of the data used for the study—the 2012 National Financial Capability Study (NFCS). The data set offers a nationally representative survey of people's financial attitudes and behaviors. The 25,509 individuals who took the survey were able to respond that they took a personal finance course in high school, college, through an employer, through the military, or some combination of the four courses.

The next three chapters are essays estimating the effects of financial education on financial literacy and financial behaviors. Chapter 4 (Essay 1) estimates how financial education affects financial literacy. The initial results show that financial education is positively related to higher financial literacy. Breaking down analysis to estimate how financial education affects each of the five financial literacy questions also shows that financial education is positively related to correctly answering the financial literacy

questions. People with low income and education are more affected by financial education and have larger coefficients for financial education affecting the total financial literacy score and the likelihood of answering each question correctly.

Chapter 5 (Essay 2) discusses the effect of financial education on short-term financial behaviors. Behaviors are considered short-term if the behaviors have immediate (or almost immediate) feedback which allows for a potential learn-by-doing. Results of the analysis that will be described in detail later suggest that financial education has mixed effects on the short-term financial behaviors with some significant results being positive and negative. Splitting the population by education and income however, do show that people who may need financial education the most —those who have low education and income—appear to benefit more from taking a formal financial education course than people with high education and income.

Chapter 6 (Essay 3) presents estimates of the effects of financial education on long-term financial behaviors. The influence of financial education on long-term behaviors is much stronger compared to the short-term financial behaviors suggesting that financial education has a critical role to play in shaping long-term behaviors. There are strong positive effects of financial education no matter how the population is split. It appears that financial education is important and valuable for teaching people about achieving long-term goals. There is less of a chance to learn about or change these long-term behaviors through life experience or learn-by-doing.

This dissertation finds that there are positive effects of financial education. People who have taken any course combination are more financially literate. Financial education has mixed effects on short-term behaviors. This is expected because the short-

term behaviors are less influenced through learned through formal education and more influenced through life experiences. People with low income and education however, do seem to benefit from financial education for these short-term behaviors. Finally, financial education is positively related to the long-term behaviors. People who reported taking a financial education course are more likely to engage in the long-term behaviors that lead to more positive and less costly financial outcomes.

# Chapter 2: Research Literature

This chapter reviews previous studies on financial literacy, financial education, and financial behaviors. The chapter starts with some of the difficulties with financial literacy research that include a lack of a standard definition and measurement tool. Next is research about financial education in high school, in college, at work, and for adult groups in the community. The final part of this chapter describes how this research will contribute to existing literature.

## 2.1 Defining and Measuring Financial Literacy

One of the difficulties with financial education is the lack of standard definition of financial literacy (Hastings, Madrian, and Skimmyhorn, 2013; Remund, 2010; Huston, 2010; McCormick, 2009; Fox and Bartholomae, 2008). In many studies the terms financial literacy, knowledge, and education may be used interchangeably (Huston, 2010). Table 2.1 lists the various definitions of financial literacy in different studies. Specific definitions are given only if the author(s) directly stated that this is their definition of financial literacy. The listing in the table shows that there is no standard definition, with some studies including knowledge of financial literacy and with others stating that people must be able to make sound financial decisions to be financially literate.

[Table 2.1: Financial Literacy Definitions from Previous Research]

The definitions used by Lusardi and Mitchell (2014) and Remund (2010) closely match the ideas of being financially literate for this research. Both definitions include not only understanding financial concepts but using that knowledge to make sound financial decisions. Remund (2010) also incorporates a time dimension in his definition of

financial literacy, stating that both short-term and long-term decisions are important. Other research has cited in their reviews of the literature that decisions—both long-term and short-term—are an important component of financial literacy (Fernandes, Lynch, and Netemeyer, 2014; Carlin and Robinson, 2012). This dissertation focuses on how financial education increases financial knowledge and the likelihood of engaging in different financial behaviors. This study also incorporates the time dimension from previous studies by studying behaviors that are considered short-term and long-term.

Another problem in the research literature is the lack of a standard tool for measuring financial literacy (Hung, Parker, and Yoong, 2009). Table 2.2 lists the measurement tools from the different studies. Many of the studies use different types of instruments to measure financial literacy. For example, some studies include a simple three question multiple-choice test (Lusardi, Mitchell, and Curto, 2010) while other studies include forty-eight true-false questions (Zhan, Anderson, and Scott, 2006). This study adopts a widely used measure of financial literacy based on five test questions covering different topics (Lusardi and Mitchell, 2014; Bumcrot, Lin, and Lusardi, 2013; Allgood and Walstad, 2013; Allgood and Walstad, 2012).

[Table 2.2: Financial Literacy Measurement from Previous Research]

## 2.2 Studies of High School Financial Education and Behaviors

Financial education is gaining popularity because more people understand that financial education is needed for all ages. Financial education needs to start at a younger age because financial mistakes at a young age could have lasting consequences (NASBE, 2006). Teens and preteens control a significant portion of money with many beginning to

work. Young people also need to understand the basic financial concepts before we can expect them to make long-term financial decisions as an adult.

### 2.2.1 High School Mandates

At the K-12 level many states are teaching students about personal finance. The CEE publishes a comprehensive look at K-12 economic and financial education in the United States in the Survey of the States. Comparing the 2004 and 2014 CEE Survey of the States indicates that there is progress in financial education in all areas except states that require testing. Some notable changes in K-12 financial education include:

- 43 states include personal finance in their standards (38 states in 2004)
- 35 states require the standards to be implemented (21 states in 2004)
- 19 states require a high school course to be offered (8 states in 2004)
- 17 states require a high school financial course to be taken (7 states in 2004)
- 6 states require testing (9 states in 2004)

Many financial education programs began in the late 1990s and 2000s prompting researchers to assess the effects of the programs (Fox, Bartholomae, and Lee, 2005). The goal of having high school personal finance standards is to increase financial literacy—the question is whether or not the personal standards are effective. One study found states with simply a mandated personal finance standard had no effect of students' personal finance scores (Tennyson and Nguyen, 2001). States that required a personal finance course with the mandate, however, had higher student test scores than states that had no personal finance course mandate. These results suggest that mandates together with a personal finance course do have positive effects on a person's financial literacy.

The goal of financial education may be to increase knowledge but ultimately financial education courses should encourage better financial behaviors. A study by Bernheim, Garrett, and Maki (2001) is one of the first studies to estimate the long-term effects of financial education. The authors utilized a natural experiment and asked people between the ages of 30-49 about personal finance courses from high school and their current saving rates. At the time these respondents were in high school some states had added a personal finance mandate while others had not. The personal finance mandate increased the exposure to financial education and also increased their saving rates. This effect was not immediate—saving rates were 1.5 percentage points higher but for people who started high school five years after the mandate (Bernheim, Garrett, and Maki, 2001). Personal finance education in high school can improve financial behaviors but it may take time after it is implemented to see the effects. This lag is likely due to teachers needing to be trained and well versed in the topic to be effective.

Using the 2000 U.S. census, a study by Cole and Shastry (2010) replicates and updates the Bernheim, Garrett, and Maki (2001) study to estimate how personal finance mandates in high school affect saving rates. The study uses dummy variables from 15 years before and after the mandate. Using the event-year dummy variables improves upon previous research by not assuming that the years since the mandate has a strictly linear effect. The results show that there is no measureable impact on savings—participation did not improve as a result of the mandates. Robustness checks including splitting the population by education, race, and gender reveal similar results. The study does not control for the type of mandate (standard only, required course, required test, etc.) which may be a significant factor in estimating how effective mandates are. As a

previously mentioned, the study by Tennyson and Nguyen (2001) found that the different mandates have various effects on financial literacy and it could be the case that the different mandates vary their effect on saving.

Other studies have examined the link between mandated financial education in high school and credit card behaviors. One study uses a difference-in-difference approach to estimate how mandated financial education affects credit behaviors in young adults (less than 22) (Brown et al., 2014). The study compared behaviors in treated states (Georgia, Idaho, and Texas) to the control group—states that did not have mandates and were characteristically similar to the treated states. These states were chosen because they had a financial mandate change in 2007 but no other educational reforms at the time of data collection. The study found that the mandated financial education had positive results; young adults in the treated states had higher credit card scores and lower loan delinquencies. This study improved upon previous studies by using the year the mandate was implemented in the classroom rather than the year it was enacted as most previous studies have done. The authors took into account the lag that can occur between passing a policy and enacting that policy.

Not all studies find positive results related to personal finance mandates. Data from five national biennial Jump$tart surveys to assess American high school students find that high school students are not financially literate. High school classes in personal finance or money management do not increase financial literacy of the students who took the course (Mandell and Klein, 2007; Mandell, 2008). Similarly, another study using the Jump$tart data finds that a personal finance course does not have any effects on paying off a credit card in full, never being late with a credit card payment, balancing a

checkbook, doing their own income tax, having savings and investment, and not worrying about debt. One main criticism of these studies is that there are no course-level controls. It is not clear what topics were covered in the course—was it a course on its own or a small part of another course? Also, there were no controls for type of class, instruction, course content, teacher preparation, amount of instruction, or other course characteristics that may be different one course from another.

### 2.2.2 High School Studies

Other literature about high school financial education examines how specific curriculum affects financial knowledge and behaviors. The greater availability of financial education programs means that evaluation needs to be in the forefront of program design and done carefully in order to properly assess program impacts (Fox and Bartholomae, 2008). Research has noted that there is a general lack of proper program evaluation (Fox, Bartholomae, and Lee, 2005; Lyons, et al., 2006; Willis, 2008; CFPB, 2014). One reason for the lack of evaluation may be that many of the individuals that create or run financial education programs are not capable of conducting an evaluation that will correctly assess the programs results (Lyons, et al., 2006). Without careful evaluation it is unclear if financial education works and improves financial literacy or changes behaviors.

One example of a careful evaluation is found in Walstad, Rebeck, and MacDonald (2010). The study uses a quasi-experimental design to assess if the financial instruction, *Financing Your Future* (FYF), increases student knowledge of personal finance. Results from a fixed effects regression controlling for differences across teachers showed that financial education significantly increased financial literacy. This study benefited from a

quasi-experimental design and a control group to compare the FYF curriculum effects. Independent variables in the regression controlled for course-level factors and student-level factors which improved upon previous studies that did not control for these differences.

Other studies have used specific curriculum to assess student's financial literacy. The Center for Economic Education in the UIC Department of Economics created a new financial literacy program for certain underperforming Chicago Public Schools called the After School Matters Financial Literacy (ASMFL) program (Roberts et al., 2011). The program is based off of the CEE's *Financial Fitness for Life* (FFFL) curriculum. The training was hands on and promoted knowledge of consumption decisions making/economic way of thinking, earning income, saving and investing, borrowing, and budgeting. The students participated in a campus showcase where they demonstrated some of the skills they had learned during the program. The students created a prom budget which put students in a real-world situation to make financial decisions. A more formal assessment included a pre- and post-test based on the FFFL themes. The authors suggest that the ASMFL program improved financial literacy—students scored significantly higher on the post-test than the pre-test in the areas that were taught. This finding should be carefully examined as the two schools in the study are vastly different from each other, different from the district demographics, and finally the sample is not representative of the state demographics.

A more recent study by Asarta, Hill, and Meszaros (2014) uses the *Keys to Financial Success* curriculum (called the *Keys*) to assess high school students' financial literacy. The *Keys* curriculum was developed from CEE's *Financial Fitness for Life* (FFFL),

Learning, Earning and Investing (LEI), Practical Money Skills, Virtual Economics 4.0, Capstone: Exemplary Lessons for High School Students, and lessons from the staff at the Delaware Center for Economic Education and Entrepreneurship and Federal Reserve Bank of Philadelphia. The main results are that the curriculum increased students' financial knowledge, there was a 61 percent change between the pre-test and post-test. The largest change came from the most difficult topics: *credit history and records* and *rights and responsibilities of buyers, sellers, and creditors*. These improvements were also larger than any other high school curriculum. There are some limitations noted by the authors. First, there are no student demographics due to privacy rules. There is also no control group and the sample of teachers chose to participate suggesting that there may be larger improvements because of their interest and motivation to teach the topic.

While financial education is the common method to increase financial literacy it may not be enough. Another study suggests using a new term: financial capability, a combination of financial literacy and access to financial institutions of services, to better help people (Johnson and Sherraden, 2007). The authors use an example that if a young girl takes her $50 from babysitting to a bank but cannot open up an account with less than $300 this could have costly, long-term negative associations with the bank. This study points out that financial education may need to take one more step by showing the students how to use the financial institution to help them become more financially capable.

A pre- and post-test using the *Money Talks* curriculum in high schools shows that students are financially illiterate but improve with instruction (Varcoe et al., 2005). Students answered 56 percent correct in the pre-test and 72 percent correct in the post-

test. Students also noted that their financial behaviors changed. Students reported that their attitudes about saving improved, they were more likely to shop for the best price, and they learned how to decrease the cost of auto insurance. Another similar study investigated the effects of a personal finance curriculum increasing a teen's financial literacy curriculum (Danes and Haberman, 2007). The study uses a post-then-pre evaluation technique showing that almost half of the students reported gains in their financial knowledge. Results from the study show that these same results lasted 3 months after the curriculum was taught suggesting a longer-term benefit of financial education. The results of these two studies seem promising that financial education improves financial behaviors. There are some problems with the studies, however, that should be noted when interpreting results. The post-test asked about behavior intentions rather than actual behaviors. This lack of testable knowledge should be taken into consideration when discussing the implications of the results.

Another study, which also uses the post-then-pre evaluation technique estimates the effects of the *High School Financial Planning Program* (HSFPP) (Danes, Rodriguez, and Brewton, 2013). The study found that the curriculum had positive effects on financial knowledge and financial behaviors. This study improved upon the Danes and Haberman (2007) study by using reported behavior changes rather than intentional behavior changes. This study also controlled for nesting of students, teachers, and classroom characteristics and found that student characteristics and classroom variables were related to gains in financial knowledge.

Financial education in high school has been widely studied for improving student understanding of personal finance. Many studies find positive effects of high school

financial education promoting that use of time and resources to finance these programs. Far fewer studies have investigated the effects of financial education on behaviors, specifically the long-term effects on people's behaviors. Studying the long-term effects of financial education is important to see if financial education changes behaviors and encourages people to make better financial decisions as they older.

## 2.3 Studies of College Financial Education and Behaviors

College students are at a particularly vulnerable position in life. Undergraduate students are becoming less dependent on their parents, may have disposable income from a job, and are likely taking on large amounts of debt with student loans. It is important to teach undergraduate students good financial practices before they engage in financial contracts or start to make financial decisions (Lusardi, Mitchell, and Curto, 2010). Financial mistakes made in college can also snowball into larger mistakes that can be costly. Much of the existing literature on college financial education focuses on financial behaviors with many studies focusing specifically on college students' credit card behaviors.

### 2.3.1 College Student Financial Literacy

As with high school students, college students are not financially literate. Using "What is your Investing IQ?" from *Money* magazine to study college student investment knowledge finds that in general college students do not have adequate investing knowledge—the average score was 44 out of a possible 100 (Volpe, Chen, and Pavlicko, 1996). The authors also split the students by college degree and found that business majors' average was 46 correct compared to non-business majors' average of 40. Accounting/finance majors did slightly better scoring 47 versus non-accounting/finance

majors scoring a 43. The study does not intervene with education to see if financial education improves the poor investment knowledge which would improve the study and add to literature to estimate if college students benefit from personal finance courses.

The National Longitudinal Survey of Youth asks people between the ages of 23 and 28 three questions about financial literacy (Lusardi, Mitchell, and Curto, 2010). Only 29 percent of those surveyed answered all three questions correctly and a large portion of people answered "do not know" to the questions suggesting that there are generally low levels of financial literacy among young people. Those who went to college were more financially knowledgeable on the three topics and were 4-15 percentage points more likely to answer each of the three questions correctly even after controlling for other demographic characteristics, time preference, and parent education. College students may be characteristically different from high school students. They are likely to be more motivated, have higher abilities, or be more interested in personal finance topics and because of these differences it is important to see how financial education affects each group. This study reiterates the need to split the population by education to see if financial education benefits people with more education.

### 2.3.2 Financial Behaviors

College students are now making more independent decisions including choices related to their finances. It was previously discussed how financial education can affect their knowledge of financial topics but again does the education help them make better financial decisions? Using a national online survey of currently enrolled college students ages 18 and over a study estimates the effects of students' financial behaviors and financial well-being controlling for demographics, financial characteristics, and financial

education (in high school and in the community) (Gutter and Copur, 2011). College students who took a course in high school were more likely than those who took a course through the community, to make positive financial behaviors. The community financial education course may not have gone in as much depth as the high school course which may explain the lack of statistical significance. The study shows that a high school personal finance course is still effective for college students. It is likely that the high school course was a semester or year while the community course was shorter (maybe an afternoon of a few short sessions). Therefore controlling for contact time and content of the courses could affect the impacts of the financial education course and would improve this study.

Another study estimates how personal finance education in high school, college, or both affects investment knowledge that in turn affects a person's saving rate (Peng, et al., 2007). The authors find that a college personal finance course increases the person's investment knowledge which then increases the likelihood of saving. Taking a high school or taking both a high school and college personal finance course did not increase the person's investment knowledge. Information about investment knowledge may be more relevant for college students which explains why the college course was the only effective course. High school students may not be interested in a topic that is complicated and not as relevant for them or it may not have been covered in their personal finance course due to time limitations. As discussed as limitations of previous studies, controlling for course content would improve this study.

The majority of college students are credit card holders. A recent survey by Nellie Mae (2005) found that in 2004 76 percent of college students, between the ages of 18 and

24, have at least one credit card with the average credit card balance of $2,169. Most college students report that they do not engage in sound credit card behaviors. With more credit available college students need to understand how to properly use credit cards to eliminate devastating consequences in the future. Students that make poor credit card choices could hurt their credit score and cost them in the future with high interest rates (Tufano, 2010). It should be noted that there are some instances where it is rational for college students to use credit cards. Credit cards are rarely the best option, however, with the high interest rates (Lyons, 2008). Due to the high credit card use among college students, researchers are focusing on explaining and correcting college students' credit card behaviors.

A study from a private university in Texas estimates how attitudes about money affected credit card behaviors (Roberts and Jones, 2001). The main result is that student use of credit cards were positively related with compulsive spending. While this study may provide some insight about student credit card behaviors that may be interesting for policy makers as a way to protect vulnerable people, the study is not generalizable, student demographics at the university are not representative of U.S. college students, and could be improved with the inclusion of certain controls. There is no control for education or ability other than grade level. The study could also be improved if there was a measure of financial literacy and included financial education intervention.

A study using a sample from 10 Midwest campuses estimates characteristics that explain at-risk credit card behaviors (Lyons, 2008). The credit card behaviors used in the study include: credit card balances of $1000 or more, delinquent on their credit card payments, reached their credit card limit, and only paid off their credit card balances

some of the time or never. Descriptive statistics show that 72.4 percent of students reported having at least one credit card and 42.9 percent of students with a credit card engaged in at least one of the four risky credit card behaviors. Results of the probit models show that taking a personal finance course significantly reduces the likelihood that a college student engages in the four risky financial credit card behaviors. As with many of the previous studies, more information about the course—why a student took the course, when, and the content of the course—would improve this study.

Another study using data from a large Midwestern University finds that financial knowledge, proxied by taking a personal finance course, has no effect on whether the individual has a revolving balance but has a negative effect on the amount of the revolving balance (Robb and Sharpe, 2009). The authors controlled for a personal finance course, however, there is no information about the content and timing of the course which would improve the study's findings.

Previous studies may or may not have accounted for a personal finance course taken but not many studies have looked at results of a specific curriculum in college. The benefits of using a specific curriculum is that the researcher(s) know the content that is taught. Also, if more colleges/universities adopt the same materials comparisons can be made and there is more information and controls which improves financial education research.

One study using a specific curriculum intervention, the *Credit Wise Cats* curriculum, examines college students' financial knowledge, attitudes, and behaviors towards credit cards (Borden et al., 2007). The students scored 6.08 out of 7 on the financial knowledge question; post-test financial knowledge scores were significantly higher (mean of 6.51).

This study suggests that financial education improves college students' financial knowledge about credit cards. This study would benefit from analyzing long-term effects by doing a post-test weeks or months later. Also, did the students change their credit card behaviors as a result of the curriculum intervention? Future research should look at long-term behavior changes of the curriculum.

There are some studies that seek to learn why college students make financial decisions. The following two studies attempt to explain why college students behave the way they do but do not include financial intervention to correct the behaviors. One such study uses a large sample of almost 16,000 currently enrolled college students (age 18 and older) across 15 campuses (mostly large state universities) the authors estimate how financial socialization affects saving and budgeting (Gutter, Garrison, and Copur, 2010). Financial socialization is defined in previous literature as the process that young people acquire skills, knowledge, and attitudes about financial matters. Results of this research find that there is a positive relationship between financial social learning opportunities and saving and budgeting. Students who had more opportunities to discuss and observe their parents and peers were more likely to save and budget. The study also finds that increasing the frequency of engaging in a social learning opportunity (except observing peers) increases the financial behaviors. While the study does not include financial education intervention the authors draw implications from this research for financial education programs to utilize family or peer involvement.

Another study attempting to explain financial behaviors of college students finds that students with higher sensation-seeking skills tended to have more problematic financial behaviors (Worthy, Jonkman, and Blinn-Pink, 2010). The authors use 9 financial

behaviors related to cash, credit, and saving management to create a financial behavior variable. Students were asked to choose between 10 paired statements to determine their sensation-seeking index. An example asked if students preferred "wild, uninhibited parties" versus "quiet parties with good conversation". The higher the score the more problematic behaviors the student engages in. The study could be improved by including a control for ability such as GPA or SAT/ACT scores. Also, there was no control for personal finance course or financial literacy. These variables are important determinants of an individual engaging in financial behaviors.

College financial education has not been as widely studied as high school financial education. There is also a lack of studies that look at how financial education affects behaviors. Future research needs to address this gap.

## 2.4 Studies of Employer Financial Education and Behavior

Workplace financial education has gained popularity as more employees are responsible for their retirement. Employees lack financial literacy which can have adverse effects. The goal of financial education in the workplace is improve financial behaviors. Much of the literature focuses on retirement planning.

Bernheim and Garrett (2003) estimate how workplace financial education affects people's saving rates. The results from this study suggest that the availability of financial education has a positive effect on a person's saving behaviors. Asset accumulation (having a 401(k) and a higher saving rate) is positively related to the availability of financial education for people with lower general wealth. The authors note that these results should be carefully interpreted because employers that offer financial education may be characteristically different than employers that do not.

Another study expands upon the previous study by Bernheim and Garrett (2003) to see how workplace financial education affects retirement contribution (Bayer, Bernheim, and Scholz, 2009). Data for the study come from 1993 and 1994 KPMG Peat Marwick Retirement Benefits Survey. Employers were asked about retirement plan features, employee utilization of the plans, and basic employer data including total employees, sales, and industry. The authors also control for type of financial education including newsletters, investment seminars for all employees, seminars for employees over 50, and seminars for employees within a year or two of retirement. After weighting by total employees 80 percent of employers offered newsletters and 44 percent offered seminars. The results show that financial education is more likely to be offered at places where there are multiple retirement plans, which may be why there has been a rising popularity of employee financial education since employers changed to self-directed 401(k)s. Also, retirement seminars are associated with higher rates of participation and contribution when the seminars are offered frequently.

One study utilizes an experiment to estimate how retirement information sent by a flyer to a randomly selected a group of employees at six large employers affects retirement participation (Clark, Morrill, and Allen, 2012). The control group was not sent the flyer. Results showed that there was no statistical difference between the treated and control groups for the number of employees who signed up. There was a difference for the youngest group ages 18-24. Those who received the letter increased participation by 7.7 percent compared to 3.3 percent increased participation by those who did not get the letter. This study shows that financial information does affect some workers' behavior. Financial education research should continue exploring how different groups

are affected by financial education so that courses can be targeted to these people and be more effective.

Most employer financial education focuses on retirement topics. One study that does not study retirement uses a national sample of 1486 employees from a large insurance company examines how a Financial Awareness Workshop affects financial literacy and subsequently to see if the program encourages employers to have better expectations for their future financial situation and workplace satisfaction (Hira and Loibl, 2005). The main finding of this study is that employees who participated in the half day financial education program were more likely to have higher financial literacy levels, which then made the employees more likely to be confident with their future financial situation and then to be more satisfied with their workplace. The financial literacy measure is 4 questions rated on a 5-item Likert scale ranging from *strongly disagree=1* to *strongly agree=5*. Questions included: "I have a very clear idea of my financial needs during retirement". It is unclear what topics are covered in the course or why the person took the course, which could bias results. The study would also benefit from a more objective measure of a person's financial literacy.

Results from employer financial education may be biased. Workplaces that offer financial education may be characteristically different than workplaces that do not offer financial education. For example, financial education is costly and companies that offer financial education are likely to be larger companies that are highly profitable. Small, less profitable companies may not have the opportunities to educate their employees. People who work for companies that offer financial education may also be generally more educated and value education more. Employees may also choose to participate in

the financial education which can cause selection bias in some studies (Kim, 2008). These problems may hinder researchers from correctly assessing the effects of financial education in the workplace and should be remembered when drawing implications from employer financial education.

## 2.5 Studies of Adults Financial Education and Behavior

While the young are vulnerable and need financial education adults are also in need of financial education as they face an even more complex financial world and suffer from a lack of time to fix financial mistakes as some are nearing retirement. A review of 41 financial education studies, research shows that the effectiveness of adult financial education is mixed (Collins and O'Rourke, 2010). Another study shows that there is a gap between the theory behind how people should behave financially and how people actually behave financially (Lyons and Neelakantan, 2008). The goal of financial education is to improve financial literacy and financial behaviors. The authors state that financial education should not be deemed a failure if there are not immediate effects. For example, people still have limited resources and are unable to save money no matter how much education they have.

### 2.5.1 Adult Studies

As with employer financial literacy literature much of the focus for adult studies are about financial behaviors. A study by Allgood and Walstad (2013) uses the 2009 NFCS to estimate how perceived and actual financial literacy affects various credit card behaviors at different ages. The behaviors examined are paying off their credit card in full, carrying over a credit card balance, paying only the minimum credit card payment, being charged a late fee, and being charged an over the limit credit card fee. In general

results showed that both perceived and actual financial literacy were related to credit card behaviors in the expected way (i.e. increased the likelihood of positive behaviors and decreased the likelihood of negative behaviors). Perceived financial literacy was, however a stronger predictor of the credit card behavior. These results are robust across numerous topics including investments, loans, insurance, and financial counseling (Allgood and Walstad, 2012).

Results from four panel data studies find a positive and significant relationship between confidence and knowledge—people who are more confident are more financially knowledgeable (Parker et al., 2011). Also, confidence and retirement planning is positive and significantly related even after controlling for actual financial knowledge. Having confidence in one's ability will increase retirement planning more than actual knowledge about personal finance. These findings, across the four studies are contrary to the view that confidence in one's ability will hinder their financial behaviors. Implications of this research may be to increase a person's confidence in their own financial decision making as part of financial education.

A study estimates how numeracy affects a person's knowledge of pensions and Social Security and in turn their wealth using the 2004 Health and Retirement Survey (Gustman, Steinmeier, and Tabatabai, 2012). Results show that a person's level of numeracy is not a significant determinant of their knowledge of pensions and Social Security. Pension and Social Security knowledge is however related to pension wealth. The reason there may not be a link between numeracy and knowledge of pensions may be due to reverse causality—knowledge of pensions may be increasing a person's numeracy.

Reverse causality and exogeneity is a problem in the literature that is difficult to fix. One study which controls for the exogenous variation between financial literacy and behaviors uses instruments. Lusardi and Mitchell (2007a) use the Rand American Life Panel to estimate the effects of financial literacy and retirement preparedness. There are two measure of financial literacy—basic and sophisticated financial literacy—and a measure of self-reported financial literacy. Americans are financially illiterate, less than half (47%) could answer all five basic questions and fewer could answer all of the sophisticated questions. Using mandated financial education in high school as an instrument , the multivariate analysis shows that financial literacy (especially sophisticated financial literacy) increases retirement planning above and beyond demographic characteristics (Lusardi and Mitchell, 2007a). The main implications from this research suggest that financial literacy does affect retirement planning even controlling for exogenous variation in financial literacy.

### 2.5.2 Financial Education for Specific Groups of People

Several studies have also looked at how financial education affects specific groups of people. Lusardi and Mitchell (2007b) review relevant literature about financial literacy and retirement. Looking at different studies and data the authors conclude that households are unfamiliar with financial topics. Financial literacy rises with education—people who are more educated are more likely to be more financially knowledgeable. Results from the Health and Retirement Survey (HRS) show that retirement seminars are especially important and have positive effects for people with lower income and education. Therefore, more literature focuses on financial literacy and education for target audiences.

Another group of people that are typically less financially literate are women. Fonseca, et al. (2012) use the RAND American Life Panel (APL) to interview about 2500 respondents periodically about their background, financial responsibilities, and financial literacy. Results shows that within households men are more likely to specialize in financial decisions which the authors think is likely where men are gaining their financial knowledge and why women have lower financial literacy levels. Older women may be at more of a disadvantage because they are less likely to gain financial knowledge, tend to live longer than men, and have little time to correct their financial mistakes. Lusardi and Mitchell (2008) study 785 women using the 2004 HRS to gain insight about how they make saving decisions. Only about 29 percent of the women surveyed could answer all three financial literacy questions correctly. Also, financial literacy is positively related to retirement planning. Policies or education targeting women could have positive effects on their retirement planning especially as women tend to live longer.

Another study by Lusardi, Mitchell, and Curto (2012) examines financial literacy for people aged 55+ using the 2008 HRS. Results of this study in general show that older Americans are financially illiterate even though many had made financial decisions over their lifetime. This may suggest that older adults may not learn certain concepts through experience. The authors did not intervene with financial education but in light of these results, financial education may need to occur before people are older and cover concepts that may not be able to learn through experience.

People who are economically disadvantaged may also lack the financial literacy necessary to make sound financial decisions. Participants from the *Financial Links for Low-Income People* (FLLIP) program were given a pre and post-test in five content

areas: (1) predatory lending, (2) public and work-related benefits, (3) banking practices, (4) saving and investing, and (5) credit use and interest rates (Zhan, Anderson, and Scott, 2006). People could only answer about 54 percent of the questions correctly. After the training, however financial knowledge significantly improved (74% correct) and improved across all personal characteristics. While this study shows that financial education improves financial knowledge of low-income households it should be noted that the participants from this study are self-selected to participate which may upwardly bias the results. Another limitation of this study is that it does not study how financial education for low-income people could affect their financial behaviors.

A study that does estimate how financial education for low-income people affects various financial behaviors uses data from *All My Money* financial education program developed by the University of Illinois (Lyons, Chang, and Scherpf, 2006). A retrospective pre-test (RPT) method was used to collect 4 years of repeated cross sectional data. Participants were asked at the end of the program to report about their behaviors prior to the program. Results of probit models with the dependent variable being any positive change in financial behaviors showed that the number of lessons was a significant factor contributing to positive decision making. Therefore financial education does have positive effects on financial decision making.

Many programs target people who have had previous financial troubles. One such program, the *Get Checking* program, is a "second chance" program for people who were referred by their financial institutions (Haynes-Bordas, Kiss, and Yilmazer, 2008). The *Get Checking* program was effective in improving financial management actions including communicating with financial institutions for people with previous financial

problems. The authors note that people who were referred to the program had to pay to complete the program which may lead to selection bias overstating the effects of the program.

Specific groups of the population may need financial education, there are also specific behaviors that may need financial education. For example, buying a home is a unique process that can be difficult for many people to manage. One mortgage counseling program targets low to moderate income households in Philadelphia (Carswell, 2009). Data for the study came from 1720 borrowers in Philadelphia who received counseling sponsored by the City's Office of Housing & Community Development (OHCD) in 1997 and 26 agencies that offered counseling. Results were mixed. Homeowners responded that they had less trouble paying their mortgage compared to previous rental payments. Borrowers reported making their mortgage payment their top priority over other bills. Also, the likelihood of losing their home to foreclosure was reduced. There were still issues about late payments as many people reported still making late payments. Several limitations of the data included not having information about important variables that one would expect to have an effect including education and credit score. These variables were hard to obtain because of privacy and surveys. Similarly, there is no control group that purchased a house at the same time yet did not go through mortgage counseling.

A similar study looks at mandated third-party review of mortgage contracts for high-risk borrowers from Cook County, Illinois (Agarwal et al., 2009a). The mortgage reviewers did not offer advice but rather explained the features of the contract. This study benefited by having a control group—borrowers who had similar socio-

demographic characteristics, foreclosure rates, and borrower and mortgage characteristics. Results showed that the mandated mortgage review altered both borrower and lender practices. Because of the added cost (monetary for lenders who paid for the reviewer and time for the borrower) lenders with loose approval standards left the market reducing the total number of loans. Of those who went through with the third party review, there were fewer mortgage default rates and the loan terms improved. The authors conclude that oversight and counseling costs affected borrower decisions rather than the information from the third party reviewers.

### 2.5.3 An International Comparison

While much of the literature focuses on the U.S. showing that Americans are not financially literate and make poor financial decisions, an international comparison shows that financial illiteracy is not specific only to the United States. Jappelli (2010) compares 55 countries from 1995 to 2008 to determine what factors explain differences in economic literacy. Economic literacy is measured using the IMD World Competitiveness Yearbook (WYC) where the countries' top managers and country experts respond on a 1-10 scale to the following: "Economic Literacy among the population is generally high." The main results show that countries vary widely with their economic literacy and education; results also show that social interactions are positively related to economic literacy. The contribution rate of the social security program of the country is negatively related to economic literacy suggesting that people in countries with mandated savings do not have as large of an incentive to gain economic literacy. One main criticism of this study is that the data does not measure individual levels of economic literacy but comes

from country representatives. The author mentions this limitation and states that using such micro level data would be difficult to implement and collect.

Jappelli and Padula (2013) use data from Waves 1, 2, and 3 of the Survey of Health, Ageing, and Retirement in Europe (SHARE), a representative sample of people age 50+ in several Europeans countries. On average people scored 3.426 and 3.481 out of 5 in Waves 1 and 2. Because of the endogeneity of financial literacy the authors use a 2SLS model with the respondents' math ability at age 10 as their initial stock of financial literacy and as the instrument for current financial literacy. Results from the IV estimation show that financial literacy has a positive effect on financial behaviors. A person's financial literacy score does affect their behaviors even after controlling for endogeneity.

Data from Chile includes a deeper measure of financial literacy—12 questions with 3 core questions and 9 questions about the Chilean retirement system (Behrman et al., 2012). Initial results show that Chilean respondents had little understanding about economic concepts and know little about the Chilean retirement system. OLS results showed that financial literacy is positively and significantly related to net wealth. After controlling for schooling, however, the magnitude of the financial literacy affect was reduced by half. This result suggests that financial literacy is a partial proxy for schooling. The authors use instruments from three broad areas—age dependent variables, family background factors, and respondent personality traits. The IV results show that schooling becomes statistically insignificant suggesting that financial literacy is more important that schooling for explaining variation in wealth and pension contribution.

A more specific study uses the De Nederlandsche Bank's Household Survey (DHS) between 2005 and 2006 to create a unique panel data set about household demographic and economic characteristics of the Dutch population (van Rooij, Lusardi, and Alessie, 2011). The study has 5 questions which are similar to the HRS and the NFCS questions to measure basic knowledge about financial literacy. There are also 11 more complex questions focusing on investment and portfolio design. Results show that the Dutch population is not financially literate. Only about 40 percent of the population could answer all 5 basic financial literacy questions correctly and even fewer (5%) could answer all 11 advanced financial literacy questions correctly. Estimating the effect of financial literacy on stock market participation showed that financial literacy is a significant factor for participating in the stock market even after controlling for a person's education. One standard deviation increase in advanced financial literacy increases stock market participation by 7-9 percentage points. These results suggest that financial illiteracy should not be taken lightly and that increasing financial literacy could have significant effects on a person's wealth though the stock market.

Klapper, Lusardi, and Panos (2012) use panel data from Russia from 2008 to 2009 to estimate how financial literacy affects formal and informal banking and borrowing. The study uses four financial literacy questions that measure a person's numeracy and financial knowledge. The questions are similar to the NFCS questions and other surveys done in the U.S. Descriptive statistics show that males, those married or cohabitating, younger people, residents of urban regions, more educated people, and employed in skilled or non-manual occupations are more likely to be financially literate. Two instruments are used in the IV estimation to assess how financial literacy affects financial

behaviors, the number of newspapers in circulation and the number of universities in the area. Results of the IV estimation show that people who are more financially literate are 4.4 percentage points more likely to have a bank account, 2.4 percentage points more likely to have formal credit, and 3.1 percentage points less likely to have informal credit. People who are financially literate report greater levels of unspent income and less likely to report low levels of spending. Finally, the relationship between financial literacy and unspent income is higher during the financial crisis suggesting that those who are financially literate are better able to handle and adapt to financially tough times.

## 2.6 Contribution to the Literature

This dissertation benefits from being able to estimate the effects of financial education on people's financial literacy and financial behaviors. The three types of financial education are high school, college, employer, or some combination of the three courses. The detailed analysis by type and combination of financial education has not been conducted in previous research. Most of the literature to date only estimates the effects of one of the courses at a particular education level. Previous research does not analyze how receiving financial education through taking multiple courses at different levels of education or at work affects financial literacy or financial behaviors.

This dissertation splits the population by education and income to see how financial education affects subgroups of the population that research suggests is the least financially literacy and therefore has the most need for financial education. The data is split by education into low and high education with low education including people with less than a high school education or high school degree. The high education group is people with some college or a college degree. Income is split at the median. The low

income group includes people who make less than $50,000 a year and people with high income include people who make more than $50,000 a year.

This research also improves upon previous work by using more objective measures of financial literacy and financial behaviors. Subjective measures of financial literacy are used in several studies where this dissertation uses an objective measure—the number of correct answers to financial literacy questions. Previous studies ask about how people may intend to behave after the financial education; this study uses their reported behaviors to see how financial education affects various financial behaviors.

Financial behaviors in this study are separated into short-term and long-term behaviors to analyze the different effects from financial education. Financial behaviors are split into short-term or long-term categories based on the type of feedback received from the behaviors. Short-term behaviors have almost immediate feedback while long-term behaviors have little to no feedback about whether or not you successfully engaged in the behavior. Splitting the behaviors by time dimension allow me to see how financial education affects behaviors that may be easy to learn through experience (short-term behaviors) versus behaviors that are in a way once-in-a-lifetime behaviors (long-term behaviors).

# Chapter 3: Data Set for the Study

The survey data used for this study came from the 2012 National Financial Capability Study (NFCS) which is a nationally representative survey of people's financial knowledge, attitudes and behaviors. This chapter discusses the history of the 2012 NFCS that has its origins in a 2009 NFCS. [1] Other sections explain the survey methodology, sampling, and the content of the 2012 survey. The end of the chapter presents the general descriptive statistics about the sample used for analysis in this dissertation. Included in the descriptive statistics are measures of financial literacy and financial education.

## 3.1 History and the 2009 Survey

The first NFCS was conducted in 2009. It was commissioned by the Financial Industry Regulatory Agency (FINRA) Investor Education Foundation and supported with input from the U.S. Department of Treasury and President Bush's Advisory Council on Financial Literacy. There were three main research objectives for the 2009 NFCS: (1) benchmark key measures of financial capability; (2) evaluate how those key measures vary with underlying demographic, behaviors, and attitudinal characteristics; and, (3) provide data and estimates to inform public policy toward financial capability. The survey was designed to study a variety of subjects including key measure of financial capability, financial literacy, financial behaviors, and financial attitudes. The survey also includes standard demographic characteristics. It should be noted that the goal was not to measure reactions to the financial crisis, but provide insights about financial skills, knowledge, and habits.

[1] Publicly available data, tables, survey questions, methodology, and preliminary reports (for both the 2009 and 2012 surveys) can be found at http://www.usfinancialcapability.org

The 2009 survey included three linked surveys, a National Survey (n=1488 with oversampling by selected demographic characteristics), the State-by-State Survey (n=28,146), and the Military Survey (n=800 military personnel and spouses). The National Survey instrument (which was used for the other two surveys) was designed by Professor Annamarie Lusardi (George Washington University) with the help of employees from Applied Research & Consulting LLC (ACR), the office of Financial Education of the U.S Department of the Treasury, and the FINRA Investor Education Foundation developed the instrument. Input for developing the instrument came from Craig Copeland (Employer Benefit Research Institute (EBRI), the American Institute of Certified Public Accountants (AICPA), and Professor Robert Willis (University of Michigan).

The survey instrument was piloted twice to finalize the survey questions. The first pilot included 20 in-person interviews with a researcher. The goal was to identify and fix questions that were unclear or confusing. The second pilot used Computer Aided Telephone Interview (CATI) software to interview 100 respondents through random digit dialing. Feedback from this pilot was used to make final minor changes to the survey. Finally, the 2009 National Survey was administered using the CATI software from May to June 2009.

The 2009 NFCS data has been used in various studies that estimate financial capabilities. Allgood and Walstad (2012 and 2013) used the survey to estimate how perceived and actual financial literacy affected twenty-two different financial behaviors and five credit card behaviors. Another study uses the 2009 NFCS data to examine the geographical differences of financial literacy (Bumcrot, Lin, and Lusardi, 2013). The

study finds that Americans are financially illiterate and there are demographic and geographic differences among their financial literacy. Collins (2010) uses the 2009 NFCS to estimate whether financial advice is a substitute for financial literacy. Another study uses the 2009 NFCS National Survey and finds that financial literacy is positively related to general financial well-being (Robb and Woodyard, 2011). The 2009 NFCS data set has been used in many studies in the literature, a more complete list of the studies that use the NFCS data can be found on the study's website.[2]

## 3.2 2012 NFCS survey, methodology, and content

The 2012 NCFS also was commissioned by the FINRA Investor Education Foundation. It was conducted with help from the U.S. Department of the Treasury, other government agencies, and President Obama's Advisory Council on Financial Capability. The 2012 survey only has two linked surveys—the State-by-State Survey which can be used for reporting state results and also aggregated to show national results, and the Military Survey. The basic purpose of the study was to explain how consumers face complex financial tools.

The 2012 survey instrument was largely developed from the 2009 survey instrument with new questions added to better assess people's financial capabilities. One of the changes to the 2012 survey is the inclusion of a question about financial education. This question serves as the main research topic for this dissertation. The survey asks people if they have taken financial education in high school, college, from an employer, or through the military. Another new question asks about how the household receives income (cash, checks, direct deposit to a bank account, or prepaid debit cards) and how a household

[2] See http://www.usfinancialcapability.org/datainuse.php for a more complete list of studies that use the NFCS data set.

makes payments (cash, checks, credit cards, debit cards, pre-paid debit cards, online payments from a bank, money orders, or using a mobile phone). The 2012 survey also asks more detailed questions to people who own their home. These questions include when they bought the house, how much of the purchase price was their down payment, and if they still have a mortgage on their home. There are other changes to the survey but in general, the changes to the survey added depth and clarity to subjects that researchers can use to improve their studies. The changes for the 2012 survey came from inputs of academics, policy-makers, and researchers who used the 2009 data.

The 2012 State-by-State Survey is an online survey of 25,509 American adult respondents. There is approximately 500 respondents per state plus the District of Columbia. The survey was done online and was self-administered between July and October 2012 and the data was released May 2013. The sample was drawn using non-probability quota sampling from the following online panels: the Survey Sampling International (SSI), EMI Online Research Solutions, and Research Now. These individuals were recruited to join and were offered incentives to participate. Within each state there were quotas for age, gender, ethnicity, education level, and income which are based on the Census Bureau's American Community Survey.

With the sample of over 25,000 observations, the estimated margin of error is a half of a percentage point. This margin of error increases for sub-groups of the sample. It should also be noted that errors such as coverage, nonresponse, and measurement error could affect the results. The survey is self-reported and there were no independent checks to verify responses. This questionnaire was given to each adult within a

household but selection of the household representative did not specifically target the head of household or primary financial decisions-makers.

The data are weighted to be representative of the Census distribution based on the American Community Survey. There are three weights included in the data, national, regional, and state. The national weight is representative of the population's age, gender, ethnicity, education, and census division. The regional weight is representative of each Census Division in terms of age, gender, ethnicity, education, and state. Finally, the state weight is representative of each state in terms of age, gender, ethnicity, and education. Note that there is no weighting to account for non-response bias.

The 2012 survey contains about 140 questions. It begins by asking about the person's demographic characteristics including gender, age, marital status, ethnicity, living situation, income, employment, education, and number of children. After the demographic questions there are sections that ask about the following: (1) financial attitudes and behaviors; (2) financial advisors; (3) money management; (4) retirement accounts; (5) sources of income; (6) home and mortgages; (7) credit cards; (8) other deb; (9) insurance; and (10) financial self-assessment and financial literacy including questions about financial education. Each essay in this dissertation uses data from the NFCS to assess the effects of financial education. More details about specific areas and questions from the survey that are used for the dissertation are discussed in each essay.

## 3.3 Descriptive Statistics

The 2012 NFCS data set includes three sampling weights, one for each level of analysis: national, regional, or state. The data is weighted using the national-level weight which is representative of the U.S. population's age, gender, ethnicity, education,

and census division. Descriptive statistics for the weighted 2012 NFCS data set are in Table 3.1. Also included in Table 3.1 are the weighted descriptive statistics for the 2009 NFCS data set which have similar proportions and means. Almost half (49%) of the sample is male. There is about 12 to 20 percent of the sample that fall into each of the age categories. Almost 9 percent of the sample has less than a high school education, 29 percent has a high school degree, 36 percent has some college education, 16 percent has a college degree, and almost 10 percent has post graduate education. Fifty-four percent of the population is married, 29 percent are single, 13 percent are divorced or separated, and 4 percent are widowed. The average number of kids is about 1.

About 27 percent of the sample make less than $25,000 a year, 26 percent make $50,000 to $75,000, 22 percent make $75,000 to $150,000, and 6 percent make more than $150,000. Eight percent of the sample reported being self-employed, 45 percent are employed, 21 percent are not in the labor force, 9 percent are unemployed, and 18 percent are retired. More than half of the sample, 66 percent, reported being white with all other races being combined and making up the remaining 34 percent.

[Table 3.1: 2009 and 2012 NFCS Descriptive Statistics]

Demographic characteristics include the person's gender, ethnicity, marital status, employment, age, income, education, and number of children. All demographic characteristics are dummy variables except the number of children. Education is the highest level of schooling a person reported—less than a high school degree, a high school graduate, some college, having a college degree, and post-graduate education.

### 3.3.1: Financial Literacy Questions

The data set provides a unique look at financial literacy by asking five financial literacy questions in the survey. The five financial literacy questions include topics on interest, inflation, bond pricing, mortgages, and stocks. The questions test a respondent's knowledge of interest accrual, inflation, the relationship between bond prices and interest rates, mortgage, and the difference between stocks and mutual funds. All five questions assess general financial knowledge with the bond question being the most difficult.

These five questions have been used widely in the literature to provide a general understanding of a person's financial literacy (Lusardi and Mitchell, 2014; Bumcrot, Lin, and Lusardi, 2013; Hastings, Madrian, and Skimmyhorn, 2013; Allgood and Walstad, 2012; Lusardi, Mitchell, and Curto, 2010). The questions are multiple-choice or true-false style with the respondent being able to choose the correct answer rather than coming up with the correct answer on their own. Among the answers, respondents have the option to choose not to respond or that they do not know. Table 3.1 shows the wording of each financial literacy question with the correct answer highlighted.

[Table 3.2: Financial Literacy Questions]

Each question is coded as a dummy variable equal to 1 if the respondent correctly answered the question. If the respondent gave an incorrect response or did not know the answer the variable is coded as a zero. If the respondent did not respond or said they did not know the answer then it is assumed that they cannot answer the question correctly. The financial literacy measure for this paper is the sum the number of correct responses with possible scores ranging from 0 to 5. Respondents who scored a 5 answered all five financial literacy questions correctly while respondents who scored a 0 responded

incorrectly or did not answer the questions. Higher scores indicate that the respondent is more financially literate than those who have lower scores.

3.3.2: Financial Education Descriptive Statistics

New to the 2012 survey are questions that ask people about the financial education courses they may have taken, either in high school, college, through an employer, or through the military. These questions are also used to create the financial education variables for the analysis. People responded to a question about whether or not they took a financial education course. If the person said that they had taken a financial education course, the next question asks if the person took the course in high school, college, through an employer or through the military[3]. For this analysis employer and military financial education courses are combined because the military is another form of employment. There is also a small number of respondents who took a military financial education course. The person could respond that they took more than one financial education course, therefore there are multiple categories for coding an individual. The omitted category is that the person did not take a financial education course. The categories of financial education courses are: (1) High School course only; (2) College course only; (3) Employer course only; (4) High School and College course only; (5) High School and Employer course only; (6) College and Employer course only; and (7) High School, College, and Employer course only.

The proportion of people that took each financial education course combination is in Table 3.3. Also, the course combinations are distinct. People cannot fall into more than one of the course combinations and therefore the course combinations sum to 100

[3]Respondents could only respond to taking a personal finance course in college, through an employer, or through the military if they had previously responded that they had taken or were currently in college, currently employed, or part of the military respectively.

percent. About 4 percent of the sample took a high school course only. Similarly, about 4 percent of the sample took a college course only and only about 3 percent took an employer course only. There was only about 1 to 2 percent of the sample that took two of the financial education courses. As expected there is a relatively small percent of the sample that has taken a financial education course and that percent gets smaller as the categories include more courses. Only 3 percent of the sample has taken all three financial education courses. Almost 80 percent of the sample took no financial education course.

[Table 3.3 2012 Financial Education Course Descriptive Statistics]

Figures 3.1 to 3.5 show the financial education pathways (similar to Figures 1.1 and 1.2) for people with less than a high school education, a high school degree only, some college education, a college degree but nothing more, and post graduate education. Figures 3.6 to 3.7 show the financial education pathway for people with less than $50,000 and more than $50,000. The first cell gives the percent of the population that fall into that education category.[4] Of the people sampled, 8.67 percent of the population has less than a high school education, 29.45 percent has a high school degree, 35.91 percent of the population has some college education, 16.09 percent has a college degree, and 9.88 percent of the population has some post-graduate education. There are 52.75 percent of the sample that are low income and 47.25 percent of the sample are high income. Within each cell in the table is the percent and number of people (with the specific education attainment or income level) who fall into the financial education category.

[4] Note that the respective category is the highest education the person has attained. For example, those who went to college have a high school degree but are not counted in the high school category because that is not their highest level of education attainment.

Figure 3.1 shows that about 1 percent (n=19) of people with less than a high school education took both a high school and employer financial education course, 5.75 percent (n=110) took a high school course only, .22 percent (n=4) took an employer course only, and 93.03 percent (n=1778) did not take any financial education course.

[Figure 3.1: Financial Education Courses—Less than High school Education]

Figures 3.2 to 3.5 can be interpreted similarly. Figure 3.2 shows that 2.64 percent (n=177) of the high school graduates took both the high school and employer course, 6.60 percent (n=443) took a high school course only, about 2.01 percent (n=135) took an employer course only, and 88.76 percent (n=5958) did not take any financial education course. For this study, low education includes both those with education less than high school and high school degrees to investigate how financial education affects people with low education. Also, because of the 8 distinct categories, combining these groups increases the number of people that are in each financial education category.

[Figure 3.2: Financial Education Courses—High school Education]

Figure 3.3 shows that of the people with some college education about 3.60 percent (n=294) took a high school, college, and employer course, 3.69 percent (n=301) took both a high school and college financial education course, 2.10 percent (n=170) took a high school and employer course, 3.71 percent (n=303) took a high school course only. About 2.18 percent (n=178) took a college and employer course, 5.08 percent (n=414) took a college course only, 3.02 percent (n=246) took an employer course only, and 76.54 percent (n=6241) did not take any financial education course.

[Figure 3.3: Financial Education Courses—Some College Education]

Figure 3.4 shows the percent of college graduates in each of the financial education course categories. About 5.89 percent (n=217) took all three courses (high school, college, and employer), 5.19 percent (n=191) took a high school and college course, .69 percent (n=25) took a high school and employer course, almost 1.46 percent (n=54) took a high school course only. Almost 5.65 percent (n=208) took a college and employer course, 9.05 percent (n=333) took a college course only, 3.06 percent (n=113) took an employer course only, and 69.02 percent (n=2539) did not take any financial education course.

[Figure 3.4: Financial Education Courses—College Education]

People with some college and a college degree are also combined into the high education group in the analysis. The percent of people who did not take any financial education course for people with some college and a college degree is lower than for people that are part of the low education group. Therefore, it is important to split the population by education to see how education affects people with different education attainments.

Figure 3.5 reports the percent of people in each financial education category for people with post graduate education. The cells can be interpreted the same way as Tables 3.3 and 3.4. There are 6.54 percent (n=152) of people with post graduate education took all three courses, 5.31 percent (n=123) took a high school and college course, .71 percent (n=16) took a high school and employer course, and about 1.18 percent (n=27) took a high school course only. Almost 7.13 percent (n=165) took college and employer financial education courses, 7.55 percent (n=175) took a college course only, and 5.28

percent (n=123) took an employer course only. Finally, 66.18 percent (n=1536) of people with post graduate education did not take any financial education course.

[Figure 3.5: Financial Education Courses—Post Graduate Education]

For this analysis people with post graduate education are included in the full sample to see how the full sample is affected by financial education but not included when the sample is split by education.[5] People who go on for higher education are characteristically different from the other four education groups. Those with post graduate education are generally higher ability people with more motivation.

Figures 3.6 and 3.7 show the breakdown of financial education courses for people with low (less than $50,000) and high (more than $50,000) incomes. Figure 3.6 shows the percent of people with low income in each financial education course. There are 1.53 percent (n=206) of people with low income that took all three courses, 2.39 percent (n=276) took a high school and college course, 1.57 percent (n=181) took a high school and employer course, and 4.91 percent (n=567) took only a high school course. There are about 1.18 percent (n=136) who took a college and employer course, 3.54 percent (n=409) that took a college course, 1.75 percent (n=202) that took an employer course, and 83.13 percent (n=9606) of people with low income did not take any financial education course.

[Figure 3.6: Financial Education Courses—Low Income]

Figure 3.7 shows that for people with high income 4.41 percent (n=480) took all three courses, 3.04 percent (n=331) took a high school and college course, 2.03 percent (n=221) took a high school and employer course, and 3.31 percent (n=361) took only a

[5] Regression analysis excluding people with post graduate education in the full sample for each chapter show similar results.

high school course. There were 3.77 percent (n=411) of people with high income who took a college and employer course, 4.62 percent (n=503) took a college course only, and 3.79 percent (n=413) took an employer course. Finally, 75.03 percent (n=8172) of people with high income did not take any financial education course.

[Figure 3.7: Financial Education Courses—High Income]

## 3.4 Conclusion

The 2012 NFCS is a unique survey about U.S. adult financial capabilities. The survey offers nationally representative data with information about people's demographic characteristics, financial behaviors, financial education, and financial literacy. The questions in the survey have been developed and designed by researchers and tested by an independent research and data firm. The NFCS data sets have been used in previous research about financial literacy. Finally, the financial literacy questions offer a measure of financial literacy and have been widely used in previous literature (through the NFCS, Health and Retirement Survey, and the RAND American Life Panel). The following three essays use demographic characteristics and financial education to assess financial literacy and financial behaviors

# Chapter 4: The Effects of Financial Education on Financial Literacy (Essay 1)

The first essay focuses on whether or not financial education increases a person's financial literacy score. One goal of financial education is to increase knowledge that should translate into more correct answers to financial literacy questions. In the analysis a person's financial literacy score is the dependent variable and person's demographic characteristics and the type of financial education course the person took (high school, college, employer, or some combination of the three) are the control variables. I also split the population by education and income. Previous research has found that those with higher incomes and education are more financially literate and therefore splitting the population into groups based on their education and income allows me to see how each group is affected by formal financial education.

The main results suggest that financial education is effective and is positively related to higher financial literacy scores. Financial education is also positively related to answering each individual question correctly. Finally, those whom previous research has found to be more financially illiterate (people with low income and education) have larger effects of financial education for both their total score and individual questions.

## 4.1 Financial Literacy Score

A person's financial literacy score is the sum of the number of correct responses to the five financial literacy questions first discussed in Chapter 3. The mean financial literacy score for the full sample by course is in Table 4.1. The mean financial literacy score of those who took a financial education course is significantly higher than the mean score for people who did not take any financial education course (mean=2.83) with the

exception of those who took only a high school financial education course. Course combinations that include an employer course tend to have higher financial literacy scores. People who took only a college and employer course had the highest financial literacy score on average (mean=3.81). People who have taken an employer course are likely to be more mature and more interested in the topic which would improve their knowledge of financial literacy topics. Those who took only a high school financial education course had the lowest financial literacy score of 2.84. This low score is expected because a high school financial education course may not have covered topics that are asked in the survey because of their difficultly and their lack of relevance for high school students.

[Table 4.1: Mean Financial Literacy Scores by Course]

Table 4.2 shows the mean financial literacy score for those with low education, people who reported having less than a high school education or are high school graduates. The table compares people who have taken a financial education course to those who reported not taking any financial education course. In all course categories those who took a financial education course scored significantly higher than those who did not take a course. People who took a financial education course in high school answered an average of 2.63 questions correctly compared to people who did not take any financial education course (mean=2.35). Those who took only an employer course answered 3.00 questions correctly; people who took both the high school and employer course answered 2.91 questions correctly. Similar to the full sample, course combinations that include an employer course have higher financial literacy scores.

[Table 4.2: Low Education Mean Financial Literacy Score by Course]

Table 4.3 shows the mean financial literacy score for people with high education, those who reported their highest education level as some college or a college graduate. Again, the table shows the mean financial literacy score for each type of course or combination of courses. Note that both groups—those who took a course and those who did not—correctly answered more financial literacy questions than people with low education as reported in Table 4.2. This result should be expected as those who are in college have higher abilities and are likely to be more knowledgeable about financial topics. In general, people who took a financial education course(s) answered significantly more questions correctly than those who did not take any financial education course. The exception is for people who only took a high school course (mean=3.10) or only took a college course (mean=3.19). Similar to the full sample, financial education course combinations that include an employer course had the highest financial literacy scores. People who took an employer financial education course and a college and employer financial education course answered 3.66 and 3.62 questions correctly. The high school financial education course average is again the lowest average (mean=3.10).

[Table 4.3: High Education Mean Financial Literacy Scores by Course]

I also split the population by income and show the mean financial literacy score for both low and high income by course combination. The mean financial literacy score for people with low income (less than $50,000) is shown in Table 4.4. Similar to people with low education (Table 4.2), people with low income have relatively low financial literacy scores. People who took only a high school course, only a college course, or only an employer course answered an average of 2.56, 2.89, and 3.09 questions correctly. All of the course combinations had a statistically higher financial literacy score than

people who did not take any financial education course (mean=2.42). People who took a college and employer financial education course answered the most questions, 3.81, on average. Also, people who took a high school course answered the fewest questions (mean=2.56).

[Table 4.4: Low Income Mean Financial Literacy Score by Course]

The mean financial literacy score for people with high income (more than $50,000) is shown in Table 4.5. People with high income have higher means than people with low income (Table 4.4) regardless of taking a course or not. This again follows previous research that suggests that people with high income are more financially literate than people with low income. People who took a college and employer financial education course and only an employer financial education course had the highest mean financial literacy score answering an average of 3.91 and 3.84 questions correctly. The high school financial education course again has the lowest mean financial literacy score.

[Table 4.5: High Income Mean Financial Literacy Scores by Course]

## 4.2 Model and Score Analysis Results

This study estimates the effects of financial education using an ordered probit model because the dependent variable, financial literacy score, is a discrete and not a continuous variable. The hypothesis is that taking financial education has a positive relationship with the person's financial literacy score. People who have taken a course should be more knowledgeable and may have had practice with the various topics about financial education and answer more questions correctly.

$$Financial\ literacy\ score = \beta_0 + \beta_i X + \beta_j Fin.Ed.Course + \beta_k Z$$

The variable *X* is a vector of demographic characteristics including the person's gender, ethnicity, marital status, employment, age, income, education, and number of children. The demographic characteristics are all dummy variables, except for the number of children. The variable *Z* is a vector of state dummy variables to control for differences across states. Bumcrot, Lin, and Lusardi (2013) find that there is a geographical difference in individual's financial literacy; people from the south have much lower financial literacy scores than those in the north. The variables in *Financial Education Course* are the financial education courses that apply to the specific group of people. For example, those with lower education could only fall into one of three courses—*HS course only, Employer course only,* and *HS and Employer course only.* The categories are all dummy variables equal to 1 if the respondent reported taking the course or group of courses. The dependent variable, F*inancial Literacy score*, can take on whole values between 0 and 5.

4.2.1 Score Analysis for the Full Sample

Results of the ordered probit model are in Table 4.6. The table shows the predicted probabilities for each independent variable to answer 1 to 5 questions correctly. Compared to people with a college degree, people with less than a high school education are 11, 12, and 7 percentage points more likely to answer 0, 1, and 2 questions correctly and 5 to 16 percentage points less likely to answer 3, 4, and 5 questions correctly. People with a high school degree are 5, 8, and 7 percentage points more likely to answer 0, 1, and 2 questions correctly and .5, 11, and 9 percentage points less likely to answer 3, 4, and 5 questions correctly. Those who reported having some college are 2, 3, 3, and .3 percentage points more likely to answer 0, 1, 2 and 3 questions correctly and 4

percentage points each more likely to answer 4 and 5 questions correctly. Finally, those with post graduate education are 1 to 3 percentage points less likely to answer 0, 1, 2, or 3 questions correctly and 3 and 4 percentage points more likely to answer 4 and 5 questions correctly. These results follow previous research which suggests that education is positively related to financial literacy. People with more education are less likely to answer fewer questions and more likely to answer more questions correctly.

People who make less than $25,000 are 6 to 8 percentage points more likely to answer 0, 1, and 2 questions correctly and are 1, 12, and 9 percentage points less likely to answer 3-5 questions correctly compared to people who make $75,000 to $150,000. Those who make $25,000 to $50,000 are 4 to 5 percentage points more likely to answer 0, 1, and 2 questions correctly and 7 and 6 percentage points less likely to answer 4 and 5 questions correctly. People who make $50,000 to $75,000 are 2 percentage points more likely to answer 0, 1, and 2 questions correctly (each) .1 percentage point more likely to answer 3 questions correctly. They are also 3 percentage points less likely to answer 4 and 5 questions correctly (each). These results show that people who make less than $75,000 to $150,000 are more likely to have lower financial literacy scores and less likely to have high financial literacy scores which is expected. People who make $150,000 or more have opposite results; they are 1 to 2 percentage points less likely to answer 0, 1, 2, and 3 questions correctly and 3 percentage points more likely to answer 4 and 5 questions correctly (each). People with higher incomes are more likely to have higher financial literacy scores and less likely to have low financial literacy scores which is as expected again.

Taking a financial education course is negatively related to low financial literacy scores and positively related to higher financial literacy scores. The predicted probabilities are compared to people who did not take any financial education course. People who took any financial education course are 1 to 2 percentage points less likely to answer 0 questions correctly, 2 to 6 percentage points less likely to answer 1 question correctly, 3 to 8 percentage points less likely to answer 2 questions correctly, and .5 to 2 percentage points less likely to answer 3 questions correctly. The financial education course combinations are positively related to answering 4 and 5 questions correctly. Taking any course combination increases the likelihood by 3 to 6 percentage points to answer 4 correctly and 3 to 8 percentage points more likely to answer 5 questions correctly. Not only does financial education increase the likelihood of answering more questions correctly it has larger predicted probabilities for being able to answer all five questions correctly than answering 4 questions correctly.

[Table 4.6: Ordered Probit Predicted Probabilities]

### 4.2.2 Score Analysis by Education

To continue the analysis of financial education, the next two sections estimate the effects of financial education for people whom research suggests may need financial education the most—people with lower education and income. Lusardi, Mitchell, and Curto (2010) find that college students are more financially knowledgeable compared to high school students and therefore may not need formal education. Therefore, the respondents are split by education to see if the financial education course(s) has different effects based on a person's educational attainment.

To split the sample by education, those with less than high school education or are high school graduates are considered to have low education and those with some college and a college degree are considered to have high education. The ordered probit results for people with low education are in Panel A in Table 4.7. Financial education is effective and decreases the probability of having low financial literacy scores and increases the probability of having high financial literacy scores. Taking a high school, employer, or both courses decreases the probability of answering 0 questions correctly by 4 percentage points, 1 question correctly by 5 to 6 percentage points, and 2 questions correctly by 3 to 4 percentage points. The financial education course combinations, however, increases the likelihood by 2 to 8 percentage points of answering 3, 4, and 5 financial literacy questions correctly.

Ordered probit results for people with high education is in Panel B in Table 4.7. Financial education decreases the probability of having a low financial literacy score and increases the probability of answering more questions correctly. Taking a course (any course) decreases the probability of answering 0, 1, 2, and 3 questions by 1 to 5 percentage points. People with high education who took a financial education course are 2 to 5 percentage points more likely to answer 4 questions correctly and 3 to 9 percentage points more likely to answer 5 questions correctly.

[Table 4.7: Ordered Probit Predicted Probabilities Split by Education]

These results are as expected—financial education is related to higher financial literacy scores. Both people with low and high education are more likely to have higher financial literacy scores and less likely to have lower financial literacy scores. People with high education are less likely to answer three questions while those with low

education are more likely to answer three questions correctly. This difference may be due to people with more education in general being able to answer more questions and have a higher financial literacy score. Another noteworthy result from Table 4.7 is that people with low education have stronger results—the predicted probabilities are higher than the corresponding classes for people with high education. This result suggests that financial literacy is effective but more effective and important for people with low education.

### 4.2.3 Score Analysis by Income

People with high incomes are likely to acquire financial knowledge on their own but those with lower income may not have such incentives or find it too costly (Monticone, 2010). Therefore, the respondents are split by income to see if the financial education course(s) has different effects based on a person's income level. People who make less than $50,000 are considered low income and people who make more than $50,000 are considered high income.[6] Table 4.8 shows the ordered probit split by income. Results for people with low income are in Panel A. People who took any financial education course are less likely to have lower financial literacy scores and more likely to have higher financial literacy scores. Those who took any financial education course are 3 to 5 percentage points less likely to answer 0 questions correctly, 3 to 8 percentage points less likely to answer 1 question correctly, and 2 to 7 percentage points less likely to answer 2 questions correctly. People who took a financial education course are 1 to 11 percentage points more likely to answer 3, 4, and 5 questions correctly. Therefore, people who took

[6] Results remain similar using different income cut points. I chose this cut point because $50,000 is the median income.

a financial education course are more likely to answer questions correctly and less likely to have lower financial literacy scores.

The ordered probit results for people with high income are in Panel B in Table 4.8. People with higher incomes are .5 to 1 percentage point less likely to answer 0 questions correctly, 1 to 2 percentage points less likely to answer 1 question correctly, 2 to 4 percentage points less likely to answer 2 questions correctly, and 3 to 4 percentage points less likely to answer 3 questions correctly. People who took a financial education course are 1 to 2 percentage points and 4 to 9 percentage points more likely to answer 4 and 5 financial literacy questions correctly.

[Table 4.8: Ordered Probit Predicted Probabilities Split by Income]

As with the ordered probit results split by education the results split by income are as expected. People who took a financial education course are less likely to have low financial literacy scores and more likely to have high financial literacy scores. People with more income are less likely to answer 3 questions correctly while people with less income are more likely to answer 3 questions correctly. This results is again likely because people with high income are generally more financially literate and have higher financial literacy scores. Also, the predicted probabilities are larger for people with low income than high income in all cases except in the last column predicting 5 correct.

The results presented in sections 4.2.2 and 4.2.3 show that people with low education and low income have larger predicted probabilities compared to people with high education and income. This finding strengthens the argument that financial education is more effective for people who have the lowest financial literacy scores and may need financial education the most.

## 4.3 Financial Literacy Questions

The ordered probit analysis so far has estimated financial literacy as a total score. The five questions that make up the financial literacy score, however, cover a range of topics and vary in difficulty. Also, high school, college, and employer courses likely do not teach the same topics. Each question is separately estimated to examine how financial education affects each financial literacy question separately.

Table 4.9 shows the proportion who answered each question correctly for the full sample and then splits the sample by education. The full sample could answer 2.9 questions correctly. About 75 percent could answer the interest question, a relatively simple question. Sixty-one percent could answer the inflation question. The bond question, the most difficult question, is answered correctly by only 28 percent of the sample. Seventy-five percent answer the mortgage question and 48 percent answer the stock question correctly.

Table 4.9 also shows the proportion of people who could answer the questions correctly by level of education. The proportion of correct answers is significantly lower for people with low education compared to people with high education. People with low education could only answer 2.3 questions correctly. Only 65 percent would answer the interest question; 49 percent of people with low education could answer the inflation question. The bond question is even more difficult for people with low education—only 19 percent could answer it correctly. Sixty-four percent answer the mortgage question correctly and 34 percent answer the stock question correctly.

The last columns of Table 4.9 show the proportion of correct answers for people with high education. A higher proportion of people with high education could answer each

question compared to both the full sample and people with low education. People with higher education answered an average of 3.12 questions. Almost 80 percent could answer the interest question and 67 percent answered the inflation question correctly. The bond question again is the most difficult and less than a third (31%) answered this question correctly. Eighty percent answered the mortgage question correctly and 54 percent answered the stock question correctly. These results re-emphasize the need to split the population by education—people with higher education answered more questions correctly and had a higher proportion of correct answers for each individual question.

[Table 4.9: Descriptive Statistics for each question by education]

Table 4.10 shows the proportion of people with low and high income that answered each question correctly. People with higher income have statistically higher proportions of correct answers for each question. People with low income answered an average of 2.4 questions correctly. Sixty-eight percent answered the interest question correctly; fifty-two percent answered the inflation question correctly. The bond question is again the most difficult. Similar to the low income population only 21 percent could answer it correctly. Almost 66 percent could answer the mortgage question correctly and 37 percent could answer the stock question correctly.

The last columns of Table 4.10 show the proportion of people with high income who answered each question correctly. People with high income answered an average of 3.4 questions correctly. The proportions are similar to the high education group in Table 4.9. Eighty-two percent answered the interest question correctly and 72 percent answered the inflation question correctly. Just over a third (36 percent) answered the bond question

correctly. About 85 percent answered the mortgage question correctly and 61 percent answered the stock question correctly.

[Table 4.10: Descriptive Statistics for each question by income]

## 4.4 Question Analysis and Results

Each question is estimated with a separate probit model to study how the different course combinations affect the topics. The financial literacy questions range in difficulty with the bond question being the most difficult. The coefficients in Table 4.11 are the marginal effects for the full sample. All course combinations are compared to the omitted category, no financial education course. Taking a high school course increases the likelihood by 6 to 10 percentage points that a person answered the interest, inflation, mortgage, and stock questions correctly. The high school course does not affect the bond question which may be due the difficulty of the question and that topic not typically taught in high school. The college course increases the likelihood of correctly answering the interest, inflation, bond, and stock questions by 5 to 7 percentage points. Taking an employer course increases the likelihood that a person answers all of the questions correctly by 4 to 16 percentage points. The large effect on the stock question (16 percentage points) may be due to many employer courses focusing on investments.

Taking two courses, either a high school and college course, high school and employer course, or college and employer course increases the likelihood that a person answers all of the questions correctly by 5 to 12 percentage points. The two courses may reinforce financial ideas. Finally, taking all three courses—high school, college, and employer—increases the likelihood that a person answers the bond, mortgage, and stock questions by 5, 7, and 7 percentage points. Taking all three courses does not increase the

likelihood of answering interest and inflation questions correctly suggesting that taking the third course does not have much added value for those topics. The three courses may be more beneficial for the more difficult topics like the bond question.

[Table 4.11: Question Probit Model Results]

Results of the question probit model split by education are in Table 4.12. Results for the low educated group are in Panel A in Table 4.12. Again, the table shows the marginal effects. The coefficients are stronger for people with low education compared to the full sample and people with high education. People with low education who took a high school course are between 8 to 13 percentage points more likely to answer the interest, inflation, mortgage, and stock question correctly. Similar to the full sample, the high school course does not affect the bond question which may be due to the difficult topic not being taught in high school. People who took an employer course are 12 to 19 percentage points more likely to answer the bond, mortgage and stock questions correctly. Finally, taking both an employer and high school course increases the likelihood of answering the interest, bond, and mortgage questions correctly (between 10-14 percentage points).

The question probit marginal results for the higher educated group are in Panel B in Table 4.12. Taking only a high school course increases answering the interest and inflation questions correctly by 4 and 7 percentage points. A college course increases the likelihood by 5 to 8 percentage points that a person answers the interest, inflation, bond, and stock questions. Those who took an employer course increases the likelihood that a person can answer the inflation, bond, mortgage, and stock questions by 5-16 percentage points. Taking both a high school and college course increases the likelihood of

answering all five questions correctly by 7 to 12 percentage points. The high school and employer course increases the likelihood of answering the inflation and stock question by 7 and 11 percentage points. The college and employer course increases the likelihood of answering the interest, bond, mortgage, and stock questions by 6 to 9 percentage points. Lastly, taking all three courses increases the likelihood of answering the bond, mortgage, and stock question by 6 to 8 percentage points.

Financial education is positively related to answering the different questions correctly. The marginal effects are larger for people with low education. This result again strengthens the argument that people who may need financial education the most benefit more from it. People with low education need to be formally taught these financial topics.

[Table 4.12: Question Probit Model Results Split by Education]

Table 4.13 shows the results of financial education for each individual question for people with low and high incomes. Results for people with low income are in Panel A. People who took a high school course are 11, 10, 8, and 7 percentage points more likely to answer the interest, inflation, mortgage, and stock questions correctly. As previously discussed, the high school course is not likely to affect the bond question because the topic is so difficult and not usually covered at a high school level. Those who took a college course are 6 to 8 percentage points more likely to answer the interest, inflation, and bond question correctly. The employer course increases the likelihood of answering the bond, mortgage, and stock questions by 10, 10, and 19 percentage points. The high school and college course is positively related to all five questions and increases the likelihood of answering them correctly by 8 to 16 percentage points. People who took

the high school and employer course are 11, 14, and 12 percentage points more likely to answer the interest, mortgage, and stock questions correctly. People who took the college and employer course are 11 to 21 percentage points more likely to answer the five questions correctly. Finally, taking all three courses increases the likelihood of answering the mortgage and stock question by 11 percentage points each.

The probit model results for people with high income are in Panel B in Table 4.13. The high school course increases the likelihood that a person answers the interest, inflation, mortgage, and stock questions by 5 to 11 percentage points. The college course is increases the likelihood of answering the interest, inflation, bond, and stock question correctly by 5 to 8 percentage points. People who took an employer course are 6 to 14 percentage points more likely to correctly answer the interest, bond, mortgage, and stock questions. The high school and college course increases the likelihood of answering the questions (except the mortgage question) by 6 to 10 percentage points. Taking a college and employer course is positively related to answering the bond, mortgage, and stock questions correctly (5 to 10 percentage points). Those who took all three courses are 5 percentage points more likely to answer both the bond and mortgage questions correctly.

[Table 4.13: Question Probit Model Results Split by Income]

The results of the probit models splitting by both education and income suggest that financial education is important and has larger marginal effects for groups of people that need it. People with low education and income have lower financial literacy scores and seem to benefit more from education. Financial education for these groups has a stronger positive relationship with financial literacy scores and the likelihood of answering each question correctly compared to people with high education and income.

## 4.5 Implications and Limitations

Implications from the results suggest that financial education is effective—taking a financial education course is related to higher financial literacy scores. This result can be seen in the mean financial literacy scores. People who took a financial education course have statistically higher financial literacy scores compared to those who did not take any financial education course. Results from the ordered probit model show that people who took financial education are less likely to have low scores and more likely to have higher financial literacy scores.

Comparing the effects of a financial education course between the full sample and those with less than a high school or high school education shows that those with a lower education benefit more from the financial education course. The course coefficients are higher for those with lower education than the full sample. Results from the regression with lower education people provide stronger evidence about the importance of financial education. People who do not go on to college should take a financial education course to improve their financial literacy (and hopefully make sound financial choices for them or their households). Similarly, people with low income benefit more from financial education than those with higher incomes. These results follow previous literature which finds that financial education is more effective for people who need it the most and have low financial literacy (Lyons, Rachlis, and Scherpf, 2007). Policy implications from this essay suggest that financial education could be more effective if targeted at the people who need it the most.

People with a higher education and higher income still benefit from taking one or more financial education course(s) yet the benefit is not as large in most categories.

Those with higher education or income may not benefit from the personal financial education because they may be more motivated to learn on their own. They also are likely to have a higher base level of financial education and the course did not improve their financial literacy as much.

The five financial literacy questions are not the same difficulty and some characteristics or courses may improve the likelihood of answering one of the questions correctly. Results of the probit models for each financial literacy question shows that some courses are not related to certain questions. For example the high school course is not related to answering the bond question correctly. The relationship between bond pricing and interest rates is probably too difficult for high school students and therefore not taught in that course. In general, for the full sample, financial education is positively related to answering each question correctly. Splitting the sample by education and income show similar results for most courses, however financial education has larger marginal effects for people with low education and income again suggesting that financial education is even more effective for people who need it the most.

There are some general limitations of this research. First, there is no information about the content of the financial education courses. There is also no information about the topics, the length of the course, or how the course was taught which Walstad, Rebeck, and MacDonald (2010) said was important for financial education research. For this research all high school, college, and employer courses are assumed to be comparable which may not be entirely accurate. Some courses may have different lengths (a day, week, or an entire year). Also employer courses may also be specific only for that company and not comparable to other employer financial education courses. The survey

does not go into detail about when the people took the courses. It is unclear how long ago a person took a college or employer course which can affect the results. For some people they may have just finished a course while others have not taken a course in years. Information about how long ago the course is would be an important control variable.

Also, there is no information about why the individual took the course—were they required to take the course or chose to do so? There may be selection bias if those who chose to take the course are characteristically different than those who did not take the course; a common problem noted in reviews of financial education effectiveness (Willis, 2008). For example, those who took a course may be more interested in the topic or more motivated and therefore the higher financial literacy score could be related to something other than simply taking the course.

Another issue is that this is a cross-sectional study, there is no evidence that taking a financial education course causes a person to engage in the financial behaviors. This dissertation shows that there is a correlation between financial education, financial literacy, and financial behaviors, however as noted in previous literature a causal relationship is much harder to estimate (Hathaway and Khatiwada, 2008).

Several studies and reviews cite endogeneity as a problem and find that few articles control for this problem using instruments (Hastings, Madrian, and Skimmyhorn, 2013; Lusardi and Mitchell, 2014; Fernandes, Lynch, and Netemeyer, 2014). Another possible way to fix the reverse causality is to estimate the effects of financial education on bad financial behaviors—it is unlikely that a bad behavior is associated with taking more financial education (Klapper, Lusardi, and Panos, 2012).

Age was used as a proxy for experience as an attempt to account for endogeneity. People may learn financial topics through their own experience as they make financial decisions. Therefore, financial education may not be the only avenue for learning the financial topics questioned in the survey. For this estimation the sample was split into six age cohorts to see how older cohorts (people with more financial experience) are affected by financial education. The results do not strongly support the idea of experience increasing a person's financial literacy score. There are small examples that show experience matters—the high school course becomes less effective and for some courses the marginal effects gets small as the age cohort increases. Future research should continue exploring how experience shapes financial knowledge and behaviors to add to the literature about financial education's effectiveness.

# Chapter 5: The Effects of Financial Education on Short-Term Financial Behaviors (Essay 2)

Financial education should not only increase financial literacy but it should also improve people's financial behaviors. People may make poor decisions because they do not understand financial information or services. This essay focuses on how financial education affects people's short-term financial behaviors. Remund (2010) suggests that the ability to positively engage in both short-term and long-term financial behaviors should be included in the definition of financial literacy. Other researchers include both short-term and long-term behaviors as an important component of being financially literate (Fernandes, Lynch, and Netemeyer, 2014; Carlin and Robinson, 2012).

The financial behaviors are considered short-term if they have almost immediate feedback to a person. The feedback may make it easier to correct their behaviors. For example, if a person does not pay off their credit card in full, the person will know shortly that there is a credit problem to resolve when they have to pay additional money in interest. Hilgert, Hogarth, and Beverly (2003) split their financial behaviors into four categories (cash-flow management, credit management, saving, and investing) and suggest that certain basic, short-term behaviors may be more likely to learn through experience. Agarwal, et al. (2013) find in their study that credit card users learned about credit card fees by paying them and that as they owned their credit card longer the credit card users paid less in fees. Similarly, a study that looks at the difference between men and women's financial literacy suggest that men may be more financially literate because they are more likely to make financial decisions for the households and have learned

some of the financial behaviors through their experience[7] (Fonseca et al., 2012). Therefore the hypothesis is that financial education will be effective in changing short-term financial behaviors but may not have a large positive effect because the behaviors may be more affected by immediate feedback or "learning-by-doing" through life experiences.

## 5.1 Short-term Behaviors

This essay focuses on three short-term financial behaviors: (1) Paying their bills; (2) Having a checking account; and, (3) Paying their credit card in full each month.[8] The financial behaviors represent a variety of money and credit management behaviors that potentially have immediate feedback. All variables are coded as a dummy variable equal to 1 if the person responded that they positively engage in the behavior. Table 5.1 shows the wording for each question from the survey.

[Table 5.1: Short-Term Financial Behaviors]

The short-term financial behaviors that improve money and credit management are generally seen as positive and cover a range of actions that people should be able to do. For example, people should be able to cover their expenses and pay their bills each month if they budget, plan, and make financial choices based on their household income. If they do not pay their bills they get immediate feedback about their bad behavior from the companies to whom they owe money. Similarly people who don't pay off their credit card in full or carry over a credit card balance will be charged additional interest the next

[7] Many of the behaviors in this study would be considered short-term by this dissertation's definition of short-term behaviors.

[8] Other variables were initially included but did not change the results. I estimated a variable of living within means (similar to paying their bills) and there were no effects of financial education on that behavior. I also estimated other credit card behaviors that had similar results to paying a credit card in full.

month. Agarwal et al. (2013) suggest that people learned about credit card fees through experience because there was immediate negative feedback. They can learn that to avoid this costly outcome they should pay off their credit card each month. In some situations it may not be optimal for a person to pay off their credit card in full, but in most cases such actions lead to credit problem.

Table 5.2 shows the descriptive statistics for each of the three short-term financial behaviors. The table includes the proportion of people who reported engaging in each behavior for the full sample. For the full sample, in the first two columns, 41 percent reported not having troubles paying their bills, 90 percent have a checking account, and about 50 percent of the full sample pays their credit card in full each month.

The other columns of Table 5.2 show the proportions for people by level of education. The subsample of people with low education has less than a high school degree or a high school degree. The subsample of people with high education has some college experience or has graduated from college. Of the people with low education 32 percent said it was not difficult to cover their bills while 44 percent of people with high education who reported having no difficulty paying their bills. Eighty-three percent of people with low education have a checking account compared and 94 percent of people with high education have a checking account. There are 45 percent of people with low education and 49 percent of people with high education who pay their credit card in full each month. For each behavior a larger proportion of people with high education reported engaging in all of the short-term financial behaviors. The difference is statistically significant.

[Table 5.2: Short-Term Behavior Descriptive Statistics by Education]

Table 5.3 shows the descriptive statistics for the sample splitting it by income. People who make less than $50,000 are considered lower income and people who make more than $50,000 are considered higher income. Almost 26 percent of people with low income and 58 percent of people with high income are able to cover their bills each month. Eighty-four percent of people with low income and almost everyone (98%) with high income has a checking account. There are about 42 percent of people with low income who reported paying off their credit card in full compared to 55 percent of people with high income. A significantly higher proportion of people with high incomes engage in all of the short-term financial behaviors compared to people with lower incomes

[Table 5.3: Short-Term Behavior Descriptive Statistics by Income]

## 5.2 Probit Model and Results

A separate probit model is specified to estimate the effects of financial education on people's short-term financial behaviors. Each financial behavior is coded as a 1 if the person engages in the positive financial behavior.

$$Pos.ST\ Fin.Behavior = \beta_0 + \beta_i X + \beta_j Fin.Ed.Course + \beta_k Fin.Lit.Score + \beta_l Z$$

The variables in X are the demographic characteristics (gender, ethnicity, marital status, employment, age, income, education, state fixed effects, and number of children). The demographic characteristics are dummy variables (except number of children). The variables in *Financial Education Course* are the financial education courses that apply to the specific group of people. The categories are all dummy variables equal to 1 if the respondent reported taking the course or group of courses. No financial education course

is the omitted category. *Fin. Lit. Score* is the number of correct answers to the five financial literacy questions previously discussed in Chapter 3. The financial literacy questions are simply a proxy for people's financial literacy, but there are many topics that are not tested through the survey that may be covered in a financial education course.[9] Controlling for the financial literacy score in the model shows how financial education affects these behaviors above and beyond a person's stock of financial knowledge. The variable, Z, are dummy variables for the respondent's current state and controls for state variation. The dependent variable, *Positive Short Term Financial Behavior*, is the different financial behavior dummy variables: (1) Paying their bills; (2) Having a checking account; and, (3) Paying their credit card in full each month.

5.2.1 Results for the Full Sample

Table 5.4 shows the results from the three probit model regressions using the full sample. The table presents the estimated marginal effects calculated at the mean. For simplicity, this section discusses only the key findings from the table. Compared to people with a college education, people with less than a high school degree, a high school degree, and some college education were between 4 to 12 percentage points less likely to be able to cover their bills, 1 to 12 percentage points less likely to have a checking account, and 9 to 13 percentage points less likely to pay their credit card in full. People with post-graduate education were 9 percentage points more likely to pay their credit card in full. Education affects the short-term behaviors in the expected way—people with more education are more likely to have better money and credit management behaviors.

[9] Financial education and financial literacy score are not highly correlated. There were no correlation values above .08 for any course. There was a negative correlation of -.16 between financial literacy score and no course. The variables have independent effects of the short-term financial behaviors as shown by three separate regressions estimating financial education then adding the financial literacy score and vice versa.

Income is a significant factor relating to the short-term financial behaviors. Compared to people who make $75,000 to $150,000 those individuals who make less are 2 to 15 percentage points less likely to engage in any of the short-term financial behaviors. People who reported making $150,000 or more are 15 and 9 percentage points more likely to say it's not difficult to cover their bills and pay off their credit card in full. These effects follow what is expected, because people who have more money should not have cash-flow problems and would be better at managing their money and credit.

A person's stock of financial knowledge as measured by their financial literacy score has positive effects on the short-term financial behaviors. Answering an additional question correctly results in people being 2 percentage points more likely to cover their bills, 1 percentage points more likely to have a checking account, and almost 1 percentage more likely to pay their credit card in full each month. While the effects of financial literacy are positive they are minor and not a large factor contributing to whether or not a person reports engaging in these short-term financial behaviors.

[Table 5.4: Short-Term Financial Behaviors Probit Results]

The effects of financial education are mixed for these short-term financial behaviors. There are some significant effects of financial education but there are both negative and positive. On the negative side, people who only took a college course are 6 percentage points less likely to pay off their credit card in full each month compared to the omitted course combination, no financial education course. Also, compared to not taking a financial education course people who took both a high school and college course are 4 percentage points less likely to have a checking account. People who took a college

course may have large amounts of debt from their education which can negatively affect their money and credit management.

On the positive side, taking only an employer course increases the likelihood of a person covering their bills by 7 percentage points. In addition, taking all three financial education courses—high school, college, and through an employer—increases the likelihood of paying your credit card in full by 9 percentage points. These results suggest the effectiveness of financial education is mixed for short-term behaviors or may vary based on the combination of courses taken. The employer course and all three financial education courses may be effective because people who are taking a course through an employer are likely to be more mature and interested in the topics. Formal financial education may not be the most effective way to influence or change these short-term behaviors.

As a robustness check the probit models were simultaneously estimated. The simultaneous estimation estimates how financial education affects all of the three short-term financial behaviors at the same time but allows the variables to vary as they should (not holding any constant). This estimation tests whether each course combination has the same effect on all short-term financial behaviors. The course combination coefficients are significantly different comparing across the three short-term behaviors. For example, the college course coefficient for paying their credit card in full is significantly different than the college course coefficient for the other short-term financial behaviors. Therefore the significant results from the probit models are robust and the courses have significantly different effects for these behaviors when looking at individual coefficients across the short-term financial behaviors.

### 5.2.2 Results by Education

The descriptive statistics from Tables 5.2 show that a higher proportion of people with high education reported engaging in the short-term behaviors. Because of the difference in people who reported engaging in the behaviors, financial education may affect each education group differently. To analyze how financial education affects people with different education attainment the full sample is split into low and high education groups.

Table 5.5 shows the probit regression results splitting the population by education. For people with low education the financial literacy score is not as effective as the financial education course which is probably due to their low scores on the survey test. Answering one more financial literacy question correctly increases the likelihood that a person has a checking account by 2 percentage points. Those with low education have low financial literacy scores and may not be able to rely on their stock of knowledge to help them make positive financial behaviors.

Those with less than a high school and high school education are in Panel A. The effects of financial education are positive larger for people with lower education. Taking only a high school financial education course increases the likelihood of having a checking account and paying their credit card in full by 3 and 9 percentage points respectively. Taking only an employer financial education course increases the likelihood of having a checking account by 7 percentage points. Finally, taking both a high school and employer financial education course increases the likelihood of having a checking account by 20 percentage points. The financial education coefficients for

having a checking account and paying their credit card in full are larger for people with low education than the same course coefficients for people with high education.

The effects of financial education on short-term behaviors for the higher education group are found in Panel B in Table 5.5. A person's financial literacy score has small effects for the short-term behaviors. Answering another financial literacy question correctly increased the likelihood of paying their bills (2 percentage points) having a checking account (almost 1 percentage point), and paying their credit card in full each month (1 percentage point).

For people with high education there are only a few significant effects and the effects are mixed as they were for the full sample. On the negative side, taking a college course decreases the likelihood of paying their credit card in full by 7 percentage points. Taking only an employer course decreases the likelihood of paying their credit card in full by 6 percentage points. People who took a high school and employer course are 2 percentage points less likely to have a checking account. A high school and employer course decreases the likelihood of paying their credit card in full by 9 percentage points. Taking a college and employer course decreases the likelihood that a person has a checking account by 1 percentage point. On the positive side, taking only an employer financial education course increases the likelihood that a person can cover their bills by almost 10 percentage points. Finally, taking all three financial education courses (high school, college, and employer) increases the likelihood that a person pays their credit card in full each month by 10 percentage points.

[Table 5.5: Short-Term Financial Behaviors Split by Education]

### 5.2.3 Results by Income

The population is split at the median income to see how financial education affects the two groups. People who are considered lower income make less $50,000 while those who make more than $50,000 are considered higher income.[10] The descriptive statistics from Tables 5.3 also show that a higher proportion of people with high income reported engaging in the 4 short-term behaviors which is similar to people with high education. Table 5.6 shows the results of financial education for short-term behaviors splitting the population by income.

Results for people with lower income (those making less $50,000) are in Panel A in Table 5.6. Answering one more financial literacy question correctly increases the likelihood that a person has a checking account by 2 percentage points. Again, for people with lower income, who also have lower financial literacy scores, there are small effects of financial literacy for these short-term financial behaviors.

Similar to the results from splitting the sample by education, financial education is more effective for people with lower income. People who took an employer course are 7 and 6 percentage points more likely to be able to cover their bills and have a checking account. Taking both a high school and employer course made people 5 and 15 percentage points more likely to have a checking account and pay off their credit card in full each month.

Panel B in Table 5.6 shows the results of financial education for people with high income (more than $50,000). Similar to previous results the person's financial literacy score is positive but not a major factor related to short-term financial education.

[10] Results remained the same having different income cut points. I used this split because it was the median income level.

Answering an additional question correctly increases the likelihood that a person is able to cover their bills and have a checking account by 2 and .42 percentage points.

For people with higher incomes financial education has mixed effects, similar to both the full sample and those with more education. A college financial education course decreases the likelihood that a person pays their credit card in full by 7 percentage points. Compared to people who did not take any course, taking a course through an employer increases your likelihood of being able to cover your bills by 5 percentage points. Finally, taking all three financial education courses increases the likelihood of paying your credit card in full by 10 percentage points.

[Table 5.6: Short-Term Financial Behaviors Split by Income]

### 5.2.4 Results by Age

Researchers have suggested that financial knowledge may be learned through experience. Hilgert, Hogarth, and Beverly (2003) find through a survey that many people reported learning financial knowledge through experience or from family and friends. Other research shows that men may be more financially literacy than women and make better financial decisions because they have more practice and are in charge of the household's finances (Fonseca et al., 2012). Results from a study by Monticone (2010) suggest that financial wealth is positively related to financial knowledge which implies that people learn financial concepts through experiences.

Agarwal et al. (2009b) studies how age affects financial decision-making and suggests that financial decisions rely on two types of intelligence—fluid and crystalized. Fluid intelligence is performance on novel tasks that research shows is steadily declining as a person ages. Crystallized intelligence is also known as experience or knowledge.

Losing fluid intelligence over time as a person ages can be offset by gains in crystallized intelligence. Short-term financial behaviors may be learned as a person ages and gains more experience managing their money and credit.

Therefore, to estimate how experience affects financial literacy the sample is split into age cohorts similar to Allgood and Walstad (2013). Age is used as a proxy for experience. People who are older have had a chance to increase crystallized intelligence and become more financially knowledgeable through daily financial decisions. The six age categories are 18-24, 25-34, 35-44, 45-54, 55-64, and 65+. It is expected that the financial education course will become less effective as a person ages due to experience.

Results in each age cohort were similar to the full sample. There were generally few significant effects of financial education and the effects are mixed. Therefore, financial education may not be the most effective way to change these short-term behaviors. People may still learn these behaviors through life experiences. In this case, however, age may not be a good proxy for experience in this case. Results for the age cohorts are in Appendix A.

## 5.3 Implications and Limitations

Financial education has mixed effects for short-term financial behaviors. Results of the probit models show that financial education has some positive effects on the short-term financial behaviors but there are also some negative effects. Splitting the population by education and income however, shows that people who may need financial education the most —those who have low education and income—benefit more from taking a formal financial education course than people with high education and income. Financial

education seems to be more positive and effective for people with low education and income when comparing the specific financial education courses.

These results strengthen the argument for financial education but mostly for groups that suffer from low financial literacy levels which include people with low education or low income. For the general public, financial education probably should not focus a lot of time or effort on short-term behaviors that are potentially easier to learn through immediate feedback and life experience. Agarwal et al. (2013) found that people with low income reverted back to paying credit card fees twice as quickly compared to people with higher income. People with low income may need formal financial education because they may be less able to learn through experience.

There are several limitations in this essay. First, the data consists of self-reported behaviors. People may be more inclined to falsely report positively engaging in the short-term behaviors which can upwardly bias the results. Second, the analysis only looks at a small number of behaviors—do all short-term financial behaviors have mixed effects from financial education? Future research on the topics may be to examine more or different financial behaviors.

Third, the analysis may be affected by endogeneity. There may be other avenues that a person may learn these financial behaviors other than formal financial education. This essay attempted to control for experience by looking at age cohorts. People who are older would have more experience and practice with the short-term behaviors. Experience may still be an effective way to learn the short-term financial behaviors. Age, however, may not be the appropriate way to control for experience.

Financial literacy could also change a person's behaviors or the other way around—people may be more financially literate through their financial experiences. Lusardi and Mitchell (2014) conclude from their review of financial education research that financial literacy influences financial behaviors and that the causality flows from knowledge to behavior. Future research on should address this issue to see how short-term behaviors are learned. Understanding how short-term behaviors are the most efficiently learned will add to financial literacy literature.

# Chapter 6: The Effects of Financial Education on Long-Term Financial Behaviors (Essay 3)

As with the previous essay, it is important that financial education not only improve financial literacy but help people make better financial decisions. The second essay focused on more basic, short-term behaviors and found that financial education has mixed results which may be because the short-term financial behaviors may be learned another way. This essay estimates how financial education affects more complex, long-term financial behaviors.

Variables are considered long-term if the effects are not seen right away—and thus there is less chance for immediate feedback and learning by doing (Hilgert, Hogarth, and Beverly, 2003). Research by Cambell et al. (2010) suggests that financial decisions may be difficult because transactions are infrequent and there are delayed outcomes. The study specifically cited retirement and mortgage decisions as difficult behaviors to learn through experience. For example, figuring out how much a person needs for retirement is complicated and need to be planned over a long period of time to make sure a person saves enough money. If a person incorrectly calculates how much he or she needs for retirement, or does not implement a savings plan, there is not really a chance to go back and remedy the problem. A person retires so far into the future and there is no way to fix crucial mistakes made many years previously.

The hypothesis for this chapter is that financial education will have a positive effect on these long-term behaviors. Lusardi, Mitchell, and Curto (2012) find that older Americans (aged 55+) had a poor grasp of similar complex financial behaviors and still made poor financial choices despite having made many other financial decisions over

their lifetime. Therefore, because there is little immediate feedback there is less likely to be much learn-by-doing, so these long-term behaviors will be more affected by financial education than the previous essay's short-term behaviors.

## 6.1 Long-Term Behaviors

The long-term financial behaviors include: (1) Having a 3 month emergency fund; (2) Having a savings account; (3) Having a non-employer investment account; (4) Figured how much they need for retirement; and (5) Having a non-employer retirement account. The behaviors examined are a variety of long-term behaviors that review several topics including retirement, saving, and investing, the list is not a complete list of all long-term complex financial behaviors. The behaviors are a subset of complex behaviors studied by Hilgert, Hogarth, and Beverly (2003).

All variables are dummy variable equal to 1 if the person responded that they positively engage in the behavior. The behavior, figured how much they need for retirement includes two different questions, the first question asks non-retired individuals if you have tried to figure out what you need to save for retirement and the second question asks retired individuals about figuring out how much they need for retirement before they retired. If the person responded yes to either question then they variable, figured out how much they need for retirement, is coded as a 1. Table 6.1 provides the wording for each long-term behavior from the survey.

[Table 6.1: Long-Term Financial Behaviors]

The behaviors for this essay are a sub group of variables that Hilgert, Hogarth, and Beverly (2003) examined and considered more complex, long-term financial behaviors. The behaviors are considered long-term because there is little feedback available; the

effects of positively or negatively engaging in the behaviors are not likely to be felt until later in life. For example, if you did not have an emergency fund, you may not feel the effects until there is some major financial problem in your life. You are less likely to be able to learn these long-term financial behaviors through experience.

Table 6.2 shows the descriptive statistics for each of the long-term behaviors. The table includes the proportion of the full sample that report engaging in the various behaviors. Descriptive statistics for the full sample show that about 41 percent have an emergency fund, 74 percent have some sort of saving account, and 36 percent have a non-employer investment. Forty percent of the population have tried to figure out how much they need for retirement and 29 percent have a non-employer retirement account. People reported engaging in an average of 2.3 of these long-term behaviors. Also, compared to Table 5.2 fewer people engage in these long-term behaviors than the short-term financial behaviors which may be due to these behaviors being more complicated than the simple, short-term financial behaviors from the previous essay.

The other columns of Table 6.2 show the proportions of people with low and high education who engage in the long-term financial behaviors. About 30 percent of people with lower education and 45 percent of people with high education reported having an emergency fund. Sixty percent of people with low education have a savings account compared to 81 percent of those with high education. Twenty-three percent of people with low education and 40 percent of people with high education have non-retirement investments. Almost 25 percent of people with lower education have tried to figure out how much they need for retirement compared to 45 percent of people with high education. Seventeen percent of people with low education and 32 percent of people

with high education reported having a non-employer retirement account. Those with lower education reported engaging in an average of 1.7 of these long-term behaviors. The average number of long-term behaviors is 2.5 for people with higher education. People with high education are significantly more likely to engage in any of the long-term behaviors.

[Table 6.2: Long-Term Behavior Descriptive Statistics by Education]

Table 6.3 shows the proportion of people that report engaging in the five long-term financial behaviors split by income. As with the previous essays, people who make less than $50,000 are considered low income while people who make more than $50,000 are considered high income. Almost 26 percent of people with low income have an emergency fund compared to 59 percent of people with high income. Sixty percent of people with low income and 90 percent of people with high income have a savings account. Of the people with low income 18 percent have non-retirement investments compared to 54 percent of people with high income. A quarter of people with low income and more than half, 54 percent, of people with high income have tried to figure out how much they need for retirement. Thirteen percent of people with low income and 47 percent of people with high income have a non-employer retirement account. People with low income reported engaging in only 1.5 of these long-term behaviors. Finally, people with higher incomes reported engaging in 3 of these long-term behaviors. In general there is a higher proportion of people with high income who reported engaging in these long-term behaviors compared to people with low income.

[Table 6.3: Long-Term Behavior Descriptive Statistics by Income]

## 6.2 Probit Model and Results

A separate probit model is specified to estimate how financial education affects these five long-term financial behaviors. Each financial behavior is coded as a 1 if the person reports engaging in the positive financial behavior.

$$Pos.LT\ Fin.Behavior = \beta_0 + \beta_i X + \beta_j Fin.Ed.Course + \beta_k Fin.Lit.Score + \beta_l Z$$

The variable *X* is a vector of the demographic characteristics listed previously (gender, ethnicity, marital status, employment, age, income, education, and number of children). The demographic characteristics are all dummy variables except for the number of children. The variables in $Financial\ Education\ Course_i$ are the financial education courses that apply to the specific group of people. The categories are all dummy variables equal to 1 if the respondent reported taking the course or combination of courses. *Financial Literacy Score* is the number of correct questions out of five that the person answered. As discussed previously in Chapter 5 the financial literacy score is simply a proxy for financial literacy, but there are likely topics covered the financial education courses that are not tested in the 5-question test.[11] The variable *Z* are state dummy variable controlling for geographical differences.

The dependent variables, *Positive Long-Term Financial Behavior*, are the five different long-term financial behavior dummy variables. The dependent variables are behaviors that are generally seen as positive behaviors. In some situations it may be

[11]Same as with chapter 4, financial education and financial literacy score are not highly correlated. The variables have independent effects on the long-term financial behaviors as shown by five separate regressions estimating financial education then financial literacy and vice versa.

optimal for a person to not have a saving account but is generally not seen as a positive behavior. Also, the dependent variables are behaviors that all people can generally engage in. For example, people should all have a 3 month emergency fund in case of some unforeseen financial problem.

It is expected that financial education would have a positive relationship with the person engaging in each positive financial behavior. Those who have taken a course should be more knowledgeable about financial education and be able to make better financial decisions for themselves (their households). Also, because there is less of a chance to learn these behaviors through experience, formal financial education may be the only way to learn these concepts. Hilgert, Hogarth, and Beverly (2003) and Campbell et al. (2010) also suggest that experience may not be an ideal way to learn the long-term, complex because due to the lack of feedback.

### 6.2.1 Results for the Full Sample

Table 6.4 shows the results from the five probit model regressions using the full sample. The table shows the estimated marginal effects calculated at the mean. The main findings from the regressions are reported in this section. People with less than a college degree (people with less than high school, a high school degree, and some college education) are all significantly less likely to engage in any of the five behaviors. People with less than a high school degree are 14 to 23 percentage points less likely to report engaging in the five long-term financial behaviors compared to people with a college degree. Having a high school degree decreases the likelihood by 9 to 12 percentage points of engaging in the long-term behaviors. Finally, having some college decreases the likelihood of reported engaging in the five long-term financial behaviors by 4 to 11

percentage points. These results suggest that education is an important indicator of engaging in various long-term financial behaviors. People who have more education are more likely to engage in the long-term behaviors.

A person's income is also a significant factor relating to the long-term financial behaviors. Compared to people who make $75,000 to 150,000 those who make less than $25,000 are 23 to 34 percentage points less likely to report engaging in any of the long-term financial behaviors. People are 15 to 24 percentage points less likely to engage in the five long-term behaviors if they make $25,000 to 50,000 and are 7 to 13 percentage points less likely to engage in the long-term behaviors compared to people who make $50,000 to 75,000. Lastly, people who make more than $150,000 are 6 to 15 percentage points more likely to report doing the five long-term financial behaviors. The marginal effects of income are much stronger for the long-term behaviors than the short-term behaviors which may be because these long-term behaviors require higher incomes.

The financial literacy score is effective but has a small effect on the long-term financial behaviors examined in this essay. Answering an additional question correctly is related to a 2 to 5 percentage points increase in the likelihood of engaging in the five long-term financial behaviors. A person's stock of knowledge, measure by the five financial literacy questions in the survey has positive but small effects on the five long-term financial behaviors.

[Table 6.4: Long-Term Financial Behaviors for the Full Sample]

In general, the results show for the full sample that financial education is more important and has larger effects on the likelihood of engaging in the long-term behaviors compared to engaging in the short-term behaviors (as discussed in Chapter 5). The

omitted category for the financial education combinations is no financial education course. Respondents who took only a high school financial education course are between 4 and 11 percentage points more likely to have an emergency fund and try to figure out how much they need for retirement. People who report taking only a college financial education course are 6 percentage points more likely to figure out how much they need for retirement. Those who took an employer course are between 5 and 14 percentage points more likely to engage in all of the long-term financial behaviors except having an emergency fund.

People who took both a high school and college course are 7 percentage points more likely to have an emergency fund, 5 percentage points more likely to try to figure out how much they need for retirement, and 5 percentage points more likely to have a non-employer retirement account. Those who took the high school and employer financial education course are 8 to 25 percentage points more likely to engage in all of the financial behaviors suggesting that the combination of the two is important for long-term behaviors. Similarly, people who took college and employer financial education course are 7 to 19 percentage points more likely to engage in all of the financial behaviors. And finally, people taking all three courses—high school, college, and employer—are 5 to 21 percentage points more likely to engage in all of the long term-financial behaviors.

For the full sample the combinations including the employer course are the most significantly related to the long-term behaviors. The marginal effects of course combinations that include the employer financial education course are larger than other course combinations. This result may be due to people taking the employer course when they are more mature and interested in the topics. The financial behaviors may be more

relevant for someone who is at a working age compared to people who take a financial education course in high school. The employer course is also likely to be the latest class the person took and the information is still fresh in their mind.

As a robustness check each course combination coefficient is estimated simultaneously across the five long-term financial behaviors to study how a course affects each of the financial behaviors at the same time while allowing all of the variable to vary rather than holding any constant. Results from this simultaneous estimation show that the high school course, employer course, high school and employer course, college and employer course, and all three courses are significantly different for figuring out how much they need for retirement than the same courses across the five long-term behaviors. This result enforces the previous results from the probit model that found large marginal effects for this behavior. The financial education courses are even more effective for this behavior compared to the other course combinations. While there are numerous significant effects of financial education, financial education is even more effective and has a positive relationship with figuring out how much a person needs for retirement.

### 6.2.2 Results by Education

Again, education and income are related to the long-term financial behaviors. To estimate how financial education affects people based on their education and income the sample is split similar to Essays 1 and 2. Someone is considered lower educated if they have less than a high school education or a high school degree; someone is considered higher educated if they have some college education or a college degree.

Panel A in Table 6.5 shows the effects of financial education on people with lower education. A person's financial literacy score has small effects on the long-term financial

behaviors. People who answered one more question correctly are 1 to 4 percentage points more likely to report doing the five long-term financial behaviors.

People with a low education are 6 to 14 percentage points more likely to engage in any of the financial behaviors. For each behavior the marginal effect is larger than for the full sample suggesting that people with low education benefit more from the financial education. Taking a high school course is positively related to all of the five long-term financial behaviors by 5 to 12 percentage points. People who took an employer course are 17, 16, and 9 percentage points more likely to have a saving account, figure out how much they need for retirement, and have a non-employer retirement account. Those who took both the high school and employer financial education courses are 15 are 26 percentage points more likely to engage in all of the financial behaviors.

In general, the effects of financial education for people with higher education are positive and significant. Panel B in Table 6.5 shows the results for people with higher education. Answering an additional financial literacy question correctly increases the likelihood of engaging in all of the behaviors by 2 to 4 percentage points. The person's stock of financial knowledge is positive but has small effects on the long-term financial behaviors.

The marginal effects of financial education on long-term behaviors for people with higher education are smaller than both the full sample and people with lower education. The financial education course however, is more effective for long-term behaviors compared to short-term behaviors. People who took a high school course are 9 percentage points more likely to have tried to figure out how much they need for retirement and 6 percentage points less likely to have a non-employer retirement account

which is likely because it is a topic that may not be taught at the high school level. Taking a college course increases the likelihood that person with higher education has tried to figure out how much they need for retirement. People who took an employer course are 13 percent more likely to have tried to figure out how much they need for retirement.

Those who took a high school and college course are 6 percentage points more likely to have an emergency fund. Those who took a high school and employer course are 8 and 22 percentage points more likely to have an emergency fund and have tried to figure out how much they need for retirement. People who took both the college and employer course are 6 to 19 percentage points more likely to report doing all five long-term financial behaviors. Lastly, taking all three courses increases the likelihood of engaging in all five behaviors by 5 to 22 percentage points.

[Table 6.5: Long Term Financial Behaviors Split by Education]

These results reiterate findings from the full sample that financial education is important and more effective for long-term financial behaviors compared to the short-term financial behaviors. Financial education is positive for both people with high and low education. The effects of financial education for people with lower education are again larger than comparable course combinations for people with high education, which suggests that people with low education again benefit more from financial education. Regardless of education level, however, the long-term financial behaviors were positively related to taking a financial education course.

### 6.2.3 Results by Income

The population is split by the median income. People who make less than $50,000 are considered low income households while people who make more than $50,000 are considered high income households.[12] Results for people with low income (less than $50,000) are found in Panel A in Table 6.6. Answering one more financial literacy question correctly increases the likelihood of engaging in the five long-term financial behaviors by 1 to 4 percentage points. The marginal effects are positive but have small effects on the five long-term financial behaviors.

Taking a high school course increases the likelihood that a person has figured out how much they need for retirement by 10 percentage points compared to taking no financial education course. Taking a college course or an employer course is also positively related to figuring out how much they need for retirement (7 and 14 percentage points). Taking both a high school and employer financial education course increases the likelihood that a person reports doing any of the long-term financial behaviors by 12 to 30 percentage points. People who took a college and employer course are 13 and 17 percentage points more likely to have a savings account and figure out how much they need for retirement. Finally, taking all three courses—high school, college, and employer—increases the likelihood by 8 to 17 percentage points that a person reports doing all five long-term financial behaviors.

Results of the effects of financial education for people with higher incomes (more than $50,000) are in Panel B in Table 6.6. Financial literacy scores are positively related to the long-term financial behaviors. People with high income who answered an

[12] Results remained the same having different income cut points. I used this split because it was the median income level.

additional financial literacy question correctly are 2 to 5 percentage points more likely to report doing any of the long-term financial behaviors. Similar to people with lower income a person's financial literacy score is positive but the marginal effects are small.

People who took a high school financial education course are 5 and 10 percentage points more likely to have an emergency fund and figure out how much they need for retirement compared to not taking a financial education course. Taking a college course increases the likelihood that a person figures out how much they need for retirement by 5 percentage points. Those who took an employer course are 3 and 11 percentage points more likely to have a savings account and figure out how much they need for retirement. A high school and college course increases the likelihood that a person has an emergency fund by almost 8 percentage points. People who reported taking a high school and employer course are more likely to have an emergency account, have non-retirement investments, figure out how much they need for retirement, and have a non-employer retirement account (by 9 to 18 percentage points). Taking both a college and employer financial education course increases the likelihood of engaging in all five long-term financial behaviors by 6 to 18 percentage points. Those who took all three courses are 3 to 22 percentage points more likely to report engaging in all five long-term financial behaviors. Therefore, even for people with high incomes financial education is still effective and important for long-term behaviors that are hard to learn through experience.

[Table 6.6: Long Term Financial Behaviors Split by Income]

A summary table, Table 6.7 shows the results for the full sample, split by education, and split by income. The summary table shows that financial education remains effective regardless of how the sample is split. The results previously discussed and the summary

table suggests that long-term behaviors are also more affected by employer financial education courses. Combinations of courses that included an employer financial education course had the largest marginal effects. The result is likely because long-term behaviors may be more suited for adults to learn due to their timing and relevance. High school students may not be worried about retirement while someone who is older and has a job may be more interested in figuring out how much they need to save for retirement.

The summary table also indicates that the most complex long-term financial behavior, figuring out how much a person needs for retirement, is also consistently affected by financial education. This may be the most complex behavior studied. It may also be the case that people figure out how much they need for retirement in the financial education course. The results from this complex behavior emphasize the effectiveness of financial education for complex financial behaviors, and that the long-term financial behaviors need to be formally taught.

[Table 6.7: Long-Term Behaviors Summary Table]

Splitting the sample into low and high income suggests that financial education is still more effective for long-term behaviors compared to short-term behaviors. Both people with high and low incomes are positively affected by financial education. People with lower income, however, had larger financial education effects for long-term financial behaviors. This could be due to their lack of financial literacy and experience with financial behaviors in general. The long-term behaviors are complex and need to be taught rather than learned through experience. The next section explores the idea that the long-term financial behaviors are less able to learn through experience.

### 6.2.4 Results by Age

To estimate if experience affects these long-term financial behaviors, age is used as a proxy for experience. The population is split into six age cohorts (18-24, 25-34, 35-44 45-54, 55-64, and 65+) to estimate the effects of financial education for each group. People may learn by experience for the simple short-term financial behaviors because of the immediate feedback and therefore older age cohorts would have fewer significant effects from financial education. In the previous chapter financial education is not effective. It is likely that experience is still an important factor but age is not an appropriate proxy for experience in Chapter 5. For long-term behaviors, however, financial education is expected to remain effective for all age groups because the long-term behaviors are harder to learn through experience and therefore formal education will be more important to influence the long-term behaviors. Appendix B shows the results from these specific age regressions. Again, the omitted financial education combination is people who did not take any financial education course.

Results from Appendix B suggest that in general the effects of financial education for these five long-term financial behaviors remained significant and therefore formal education is more important for behaviors that do not have immediate feedback. Even for older cohorts there were still significant financial education variables.

Also, figuring out how much a person needs for retirement is the most complex financial behavior (of the five looked at in this essay) and has the lowest ability to learn through experience. For example, people may be able to learn the hard way to have an emergency fund and they may be able to correct this negative behavior for potential future needs. Figuring out how much a person needs for retirement is almost impossible

to have any feedback as retirement usually happens so far into the future and only once so there is no way to correct yourself if you have not prepared properly. Financial education remains positive and significant throughout the age cohorts for this variable. Therefore, financial education is important for complex financial behaviors that have little to no feedback to help people learn.

## 6.3 Implications and Limitations

The results from this essay suggest that a financial education course is positively related to these five long-term financial behaviors. The effects of the financial education courses are larger for long-term behaviors than for short-term behaviors. Once again, as suggested by Hilgert, Hogarth, and Beverly (2003), complex, long-term behaviors may be less likely to be learned by doing. Similarly, a study of older people shows that even people who have made a variety of financial decisions throughout their lifetime, still had troubles making decisions about similar complex financial behaviors (Lusardi, Mitchell, and Curto, 2010). Therefore financial education appears to be especially important for influencing long-term financial decisions. Also, regardless of the level of education and income financial education seems to have a significant effect on long-term behaviors.

The previous essay estimated the effects of experience for the short-term behaviors. Financial education was less significant for older cohorts with short-term financial behaviors. This essay also splits the sample into age cohorts and financial education is still an important variable across age cohorts. These results suggest that long-term behaviors may be influenced by formal instruction through a financial education course.

As with the previous essays there are some limitations. Again, the variables are self-reported and people may overstate their financial behaviors which can upwardly bias the

results. There are only five behaviors in this essay. Estimating how financial education affects more long-term behaviors will strengthen the findings from this research.

Future research may be to examine more or different financial behaviors to see if financial education has similar effects for other complex long-term financial behaviors. Even though the behaviors are less likely to be learned by doing, there may still be endogeneity in the model. Future research should continue studying whether short-term and long-term behaviors are more likely to be influence by life experience or through education. This research is valuable for policy makers and financial educators to help them develop effective and efficient financial education programs.

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# Figures

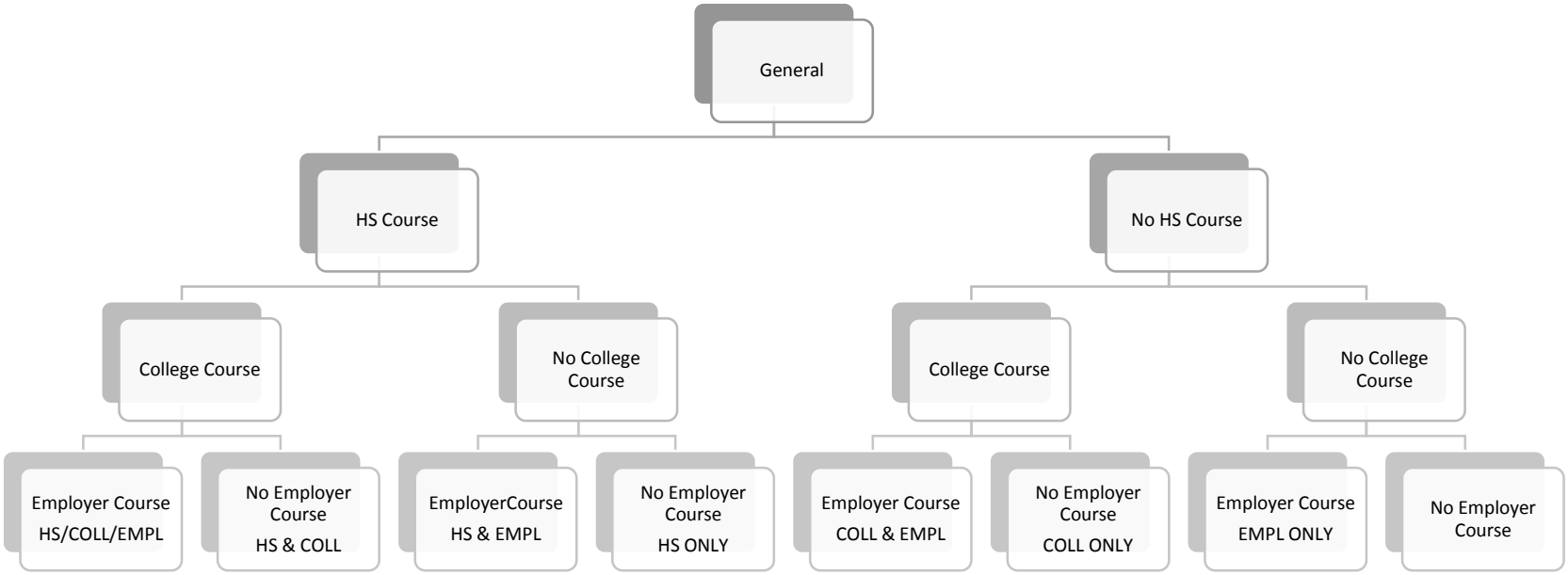


Figure 1.1: Financial Education Course Pathway

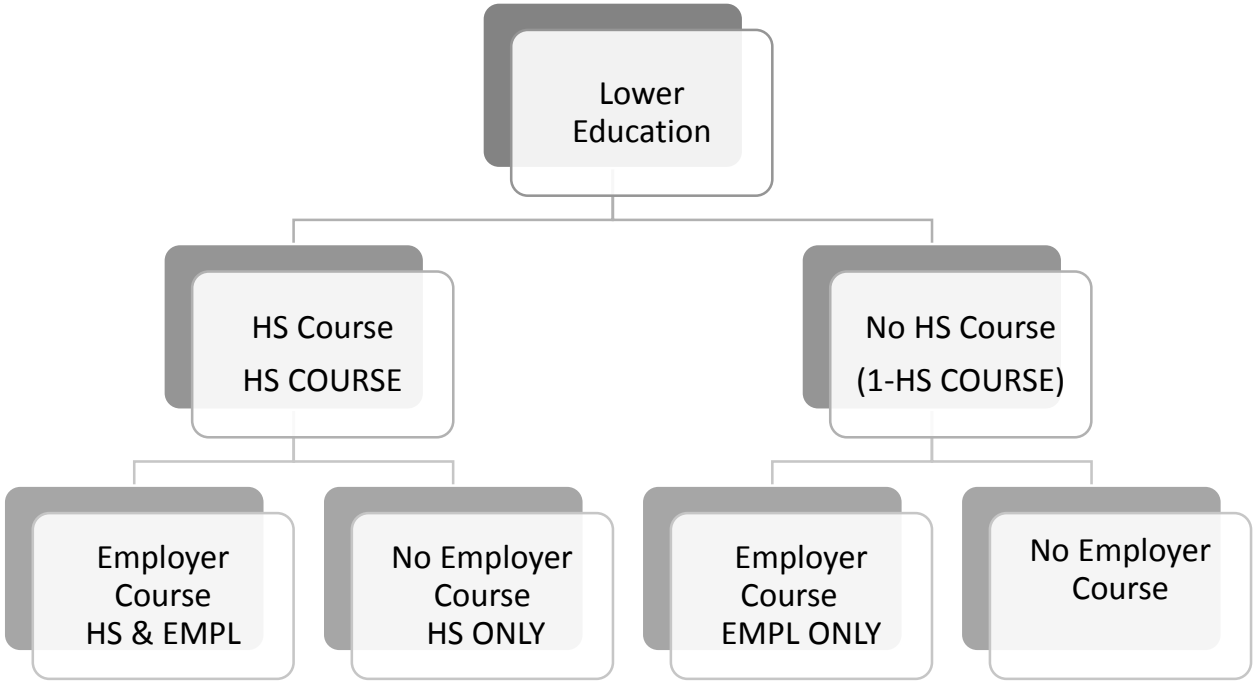


Figure 1.2: Financial Education Course Pathway (Low Education)

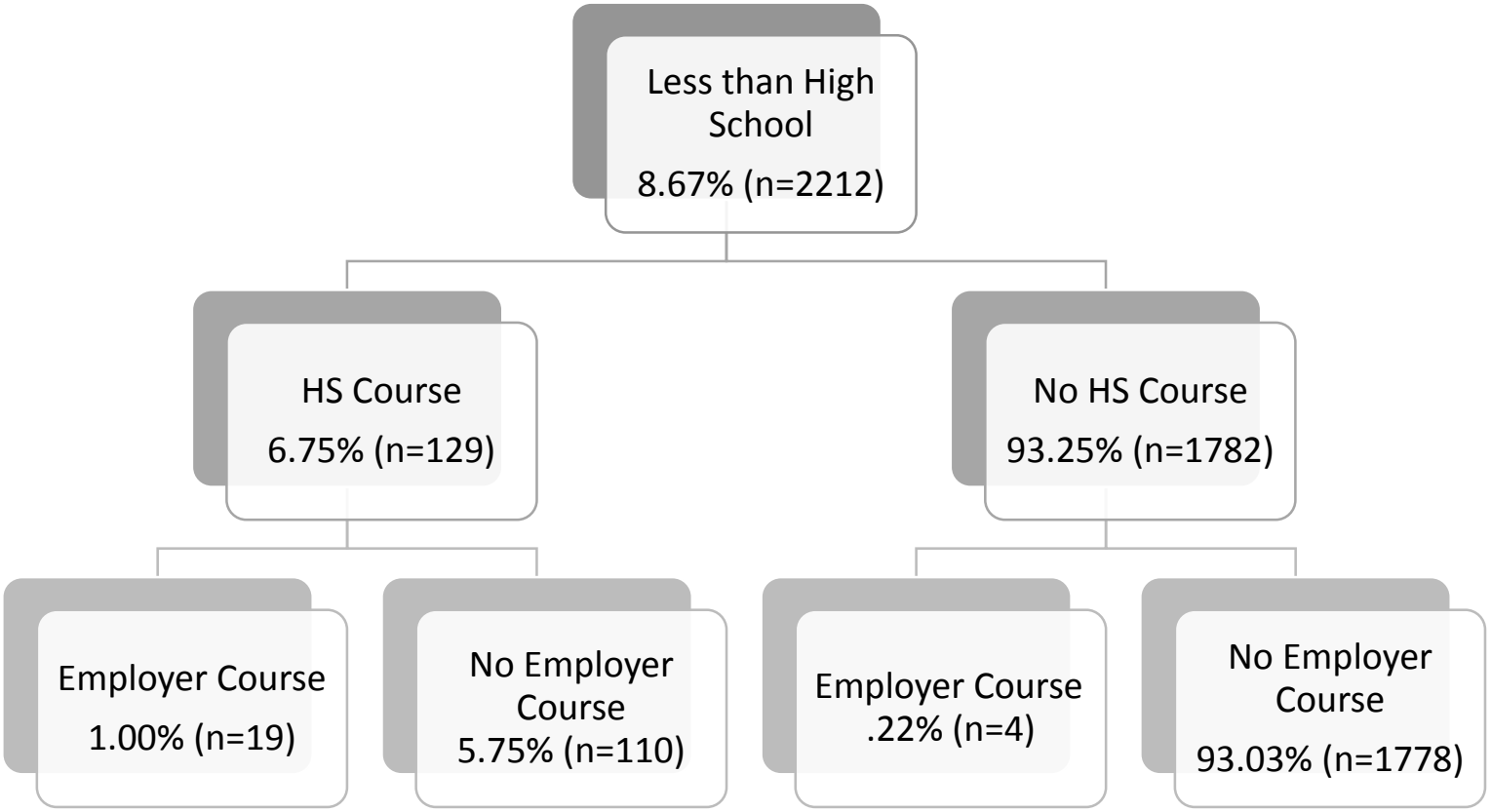


Figure 3.1: Financial Education Courses—Less than High school Education

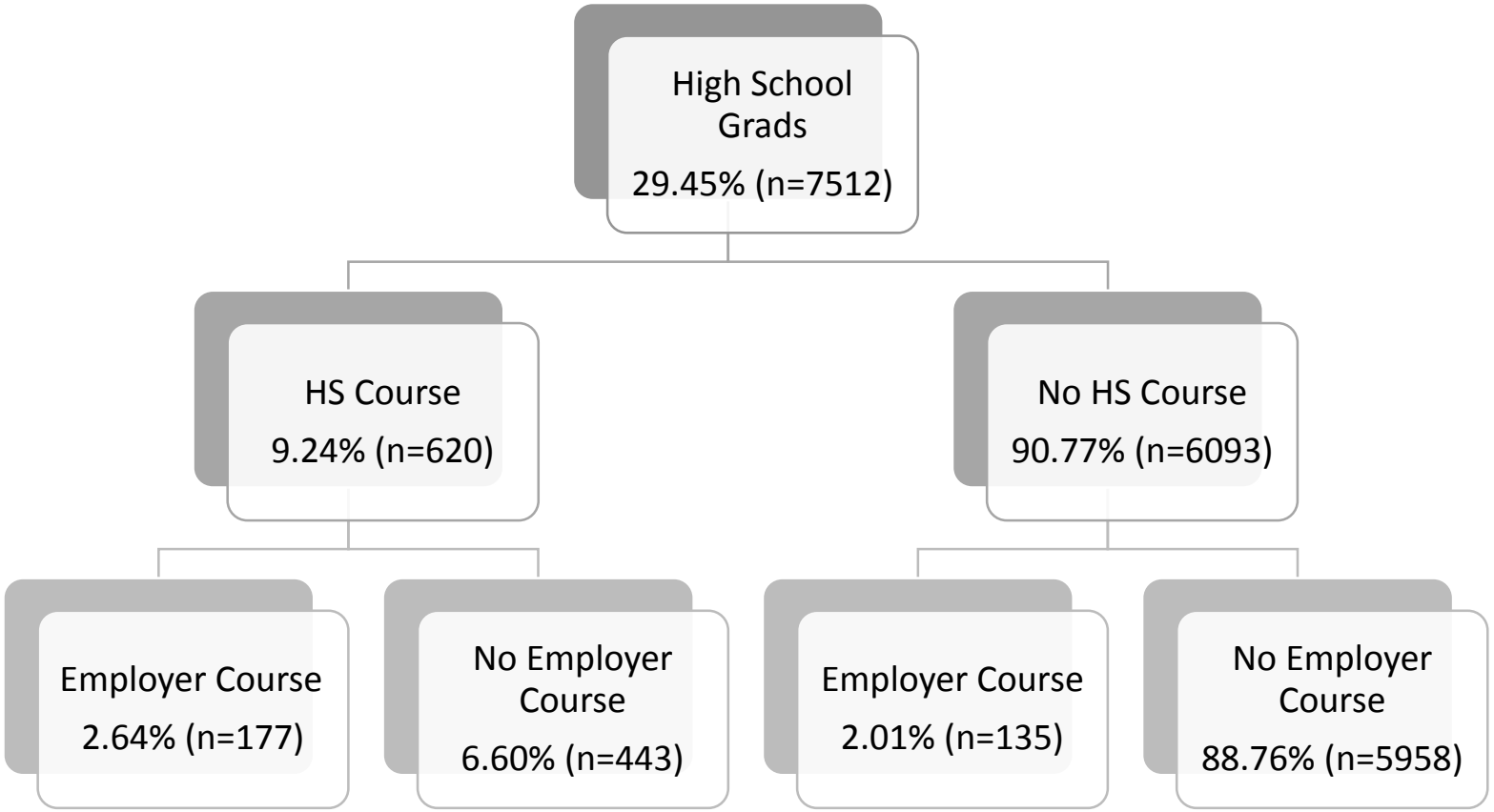


Figure 3.2: Financial Education Courses—High school Education

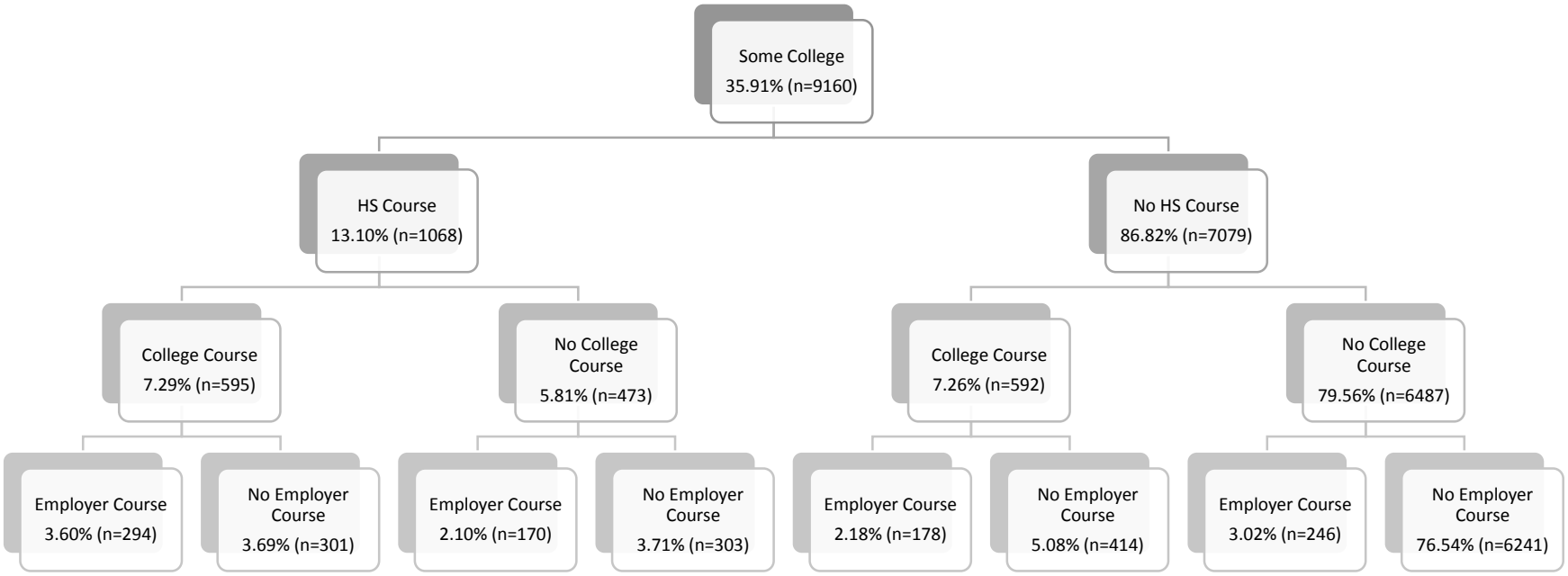


Figure 3.3: Financial Education Courses—Some College Education

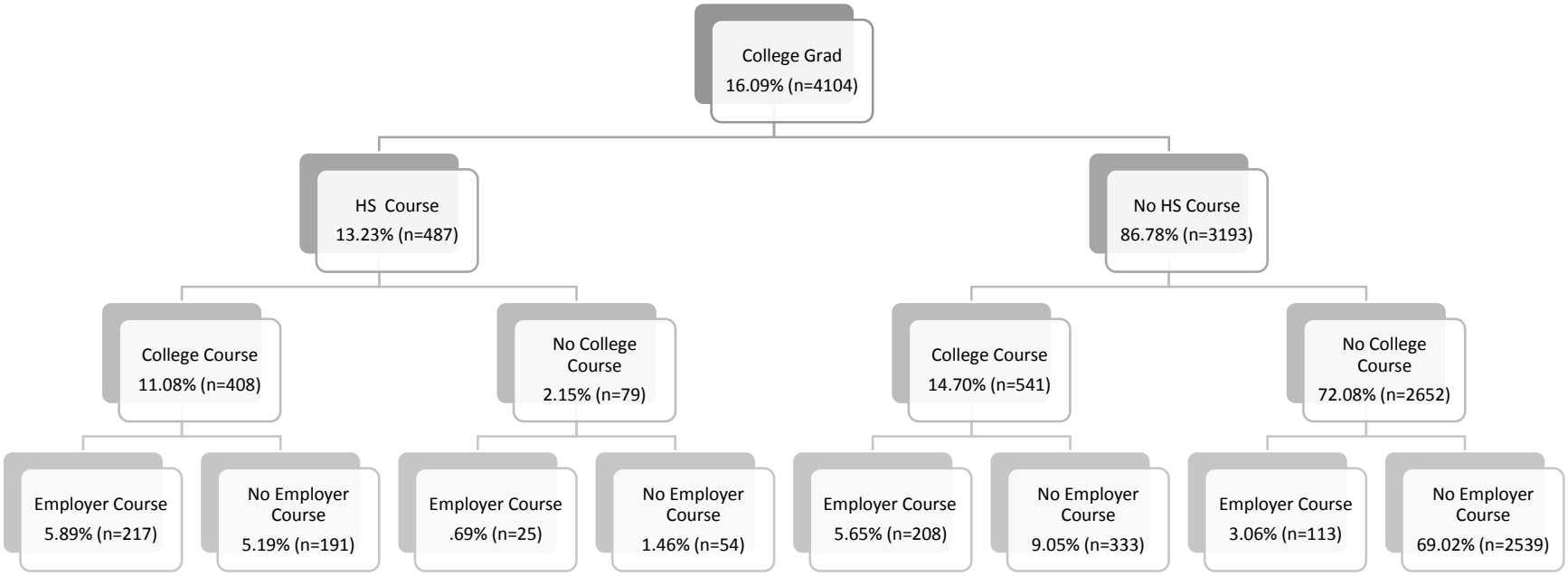


Figure 3.4: Financial Education Courses—College Education

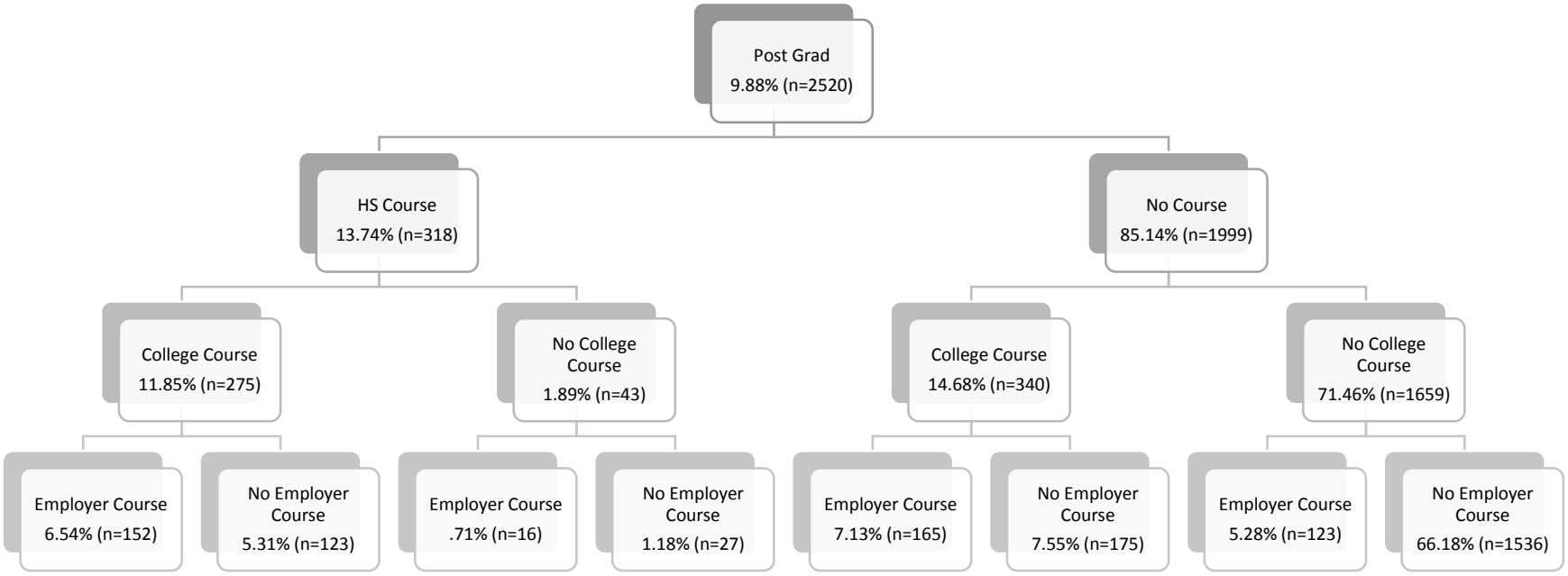


Figure 3.5: Financial Education Courses—Post Graduate Education

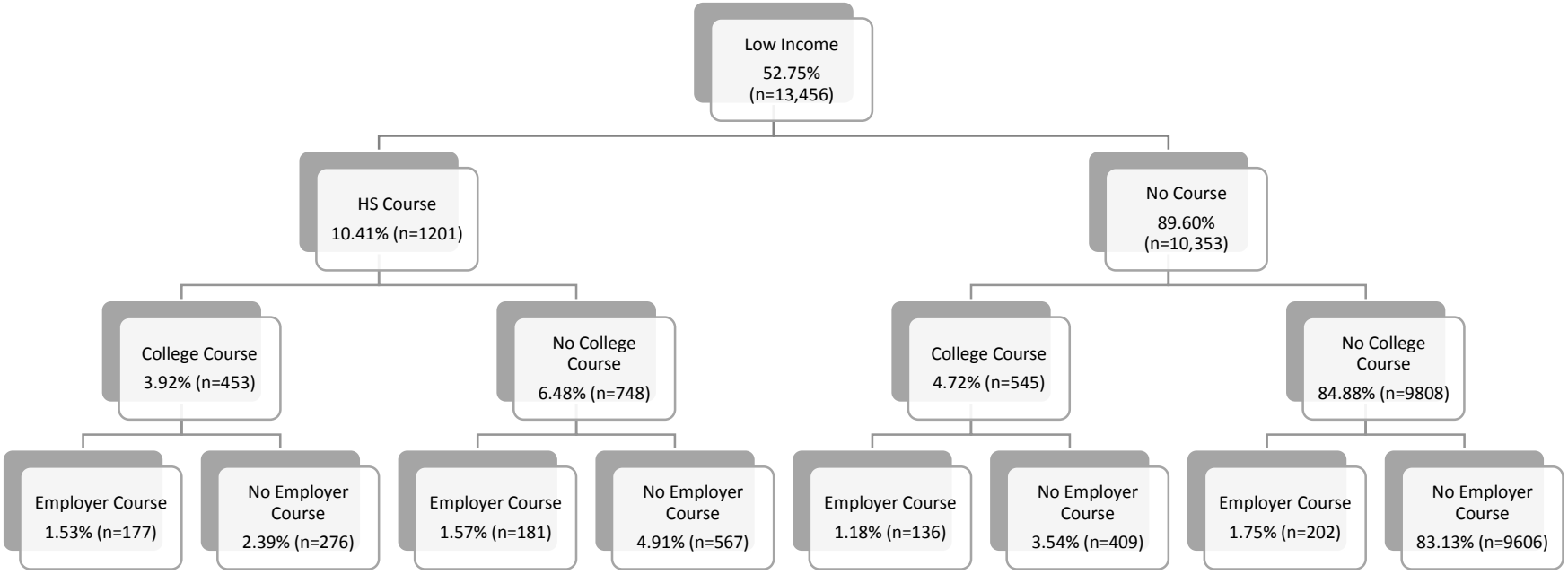


Figure 3.6: Financial Education Courses—Low Income

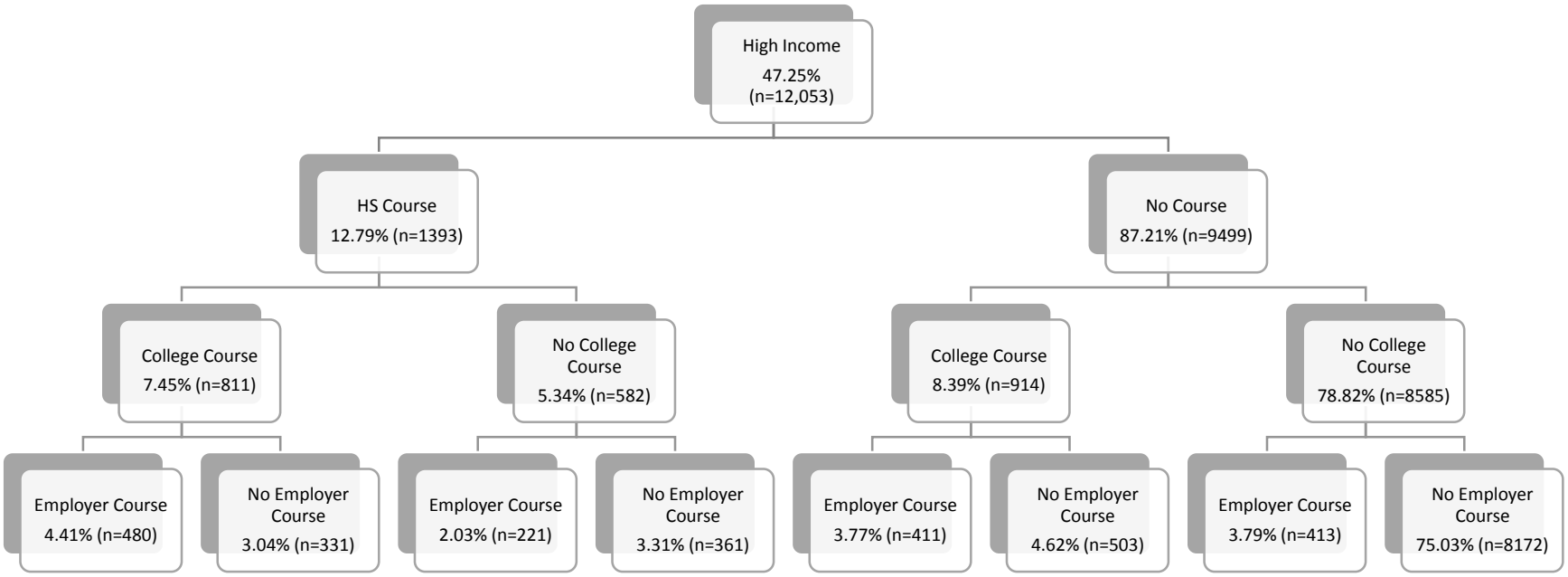


Figure 3.7: Financial Education Courses—High Income

# Tables

Table 2.1: Definitions of Financial Literacy from Previous Research

*Lusardi and Mitchell (2014)*

Financial literacy is "…people's ability to process economic information and make informed decisisons about financial planning, wealth accumulation, debt, and pensions."

*Fernandes, Lynch, Netemeyer (2014)*

Cites from previous literature that financial literacy is a measure of the degree to which one understands and is able to make personal financial decisions in the short-run and long-run.

*Hastings, Madrian, Skimmyhorn (2013)*

"As operationalized in the academic literature, financial literacy has taken on a variety of meanings; it has been used to refer to knowledge of financial products, knowledge of financial concepts, having the mathematical skills of numeracy necessary for effective financial decisions making, and being engaged in certain activities such as financial planning."

*Carlin and Robinson (2012)*

Financial Literacy is defined as "the ability to make financial decisions in their own best short- and long- term interests" (Mandell, 2008)

*Remund (2010)*

"Financial literacy is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions."

*Huston (2010)*

Financial Literacy has an added application dimension requiring the individual to have the ability and confidence to use the financial knowledge to make financial decisions.

*Gutter, Garrison, Copur (2010)*

Financial socialization (defined in previous literature) encompasses the many dimensions of money handling including earning, spending, saving, borrowing, and sharing.

*Gale and Levine (2010)*

"Financial literacy [is] the ability to make informed judgments and effective decisions regarding the use and management of money and wealth."

*Robb and Sharpe (2009)*

"…financial knowledge was defined as an individual's understanding of important concepts related to personal finance…"

*McCormick (2009)*

(defines literacy) "Literacy is the possession of basic knowledge or competence, and education is the means to build that capacity."

*Mandell (2008)*

"… the ability to evaluate the new and complex financial instruments and make informed judgments in both choice of instruments and extent of use that would be in their own best long-run interests."

*Johnson and Sherraden (2007)*

(defines financial capability) "Financial capability includes both financial education and access to financial institutions and services."

*Danes and Haberman (2007)*

"Financial literacy is the ability to interpret, communicate, compute, develop independent judgments, and take actions resulting from those processes in order to thrive in our complex financial world."

*Fox, Bartholomae, and Lee (2005); Fox and Bartholomae (2008)*

"Financial Literacy denotes one's understanding and knowledge of financial concepts and is crucial to effective consumer financial decision making."

*Vitt et al. (2005)*

"Personal financial literacy is the ability to read, analyze, manage and write about the personal financial conditions that affect material well-being. It includes the ability to discern financial choices, discuss money and financial issues without (or despite) discomfort, plan for the future, and respond competently to life events that affect every day financial decisions, including events in the general economy."

Table 2.2: Measurement of Financial Literacy from Previous Research

*Lusardi and Mitchell (2014)*

Extensive literature review. Discusses the use of the five financial literacy questions from NFCS.

*Asarta, Hill, and Meszaros (2014)*

50 multiple choice questions from Financial Fitness for Life (FFFL), Learning, Earning and Investing (LEI), Practical Money Skills, Virtual Economics 4.0, Capstone: Exemplary Lessons for High School Students, and lessons from staff at the Delaware Center for Economic Education and Entrepreneurship and Federal Reserve Bank of Philadelphia

*Klapper, Lusardi, and Panos (2013)*

Four financial literacy questions, 2 about interest rates and interest compounding, 1 about inflation, and 1 about sales discounts. The questions are similar to financial literacy questions on previous surveys including the U.S. HRS Survey, American Life Panel, and English Longitudinal Study on Aging.

*Japelli and Padula (2013)*

Microeconomic Data from SHARE and SHARELIFE to compare initial and current financial literacy. Current financial literacy is based on four financial and numerical questions in SHARE. Initial financial literacy in SHARELIFE is mathematical skills at school.

*Bumcrot, Lin, and Lusardi (2013)*

Five Questions of Financial Literacy from the 2009 NFCS.

*Allgood and Walstad (2013 and 2012)*

Five Questions of Financial Literacy from the 2009 NFCS.

*Behrman et al. (2012)*

Twelve financial literacy questions—3 core questions and 9 questions about the Chilean retirement system.

*Gustman, Steinmeier, and Tabatabai (2012)*

(numeracy measure) "Numeracy ranges from 0 to 3 and is measured by the sum of the number of correct questions to three questions—take 10 percent of a thousand. Calculate one fifth of two million. What is ten percent interest compounded over two years."

*Carlin and Robinson (2012)*

Financial decisions made at the JA Finance Park

*Collins (2010)*

Five Questions of Financial Literacy from the 2009 NFCS.

*Roberts et al. (2011)*

Students participated in Campus Showcase to show what they learned in the ASMFL program. There was also a pre- and post-test based on the FFL curriculum.

*van Rooij, Lusardi, Alessie (2011)*

Participants were asked 5 basic financial literacy questions which were similar to HRS with a few questions unique to the survey. Another 11 complex financial literacy questions about investment and portfolio choice were asked to measure advanced financial knowledge.

*Walstad, Rebeck, and MacDonald (2010)*

Pre-and post-test with 20 multiple choice questions, 17 from the *Financial Fitness for Life* tests and 13 newly written for the *Financing Your Future* curriculum.

*Remund (2010)*

Notes that surveys and polls are the most common method among researchers to measure financial literacy.

*Lusardi, Mitchell, and Curto (2010)*

Used the three questions from the 2004 health and retirement survey (HRS) (The questions are a subset of the five NFCS questions).

*Monticone (2010)*

Six financial literacy questions. Two questions were similar to the inflation and interest question from the 2004 HRS and the NFCS financial literacy questions.

*Lusardi and Mitchel (2009)*

The study uses 5 questions to assess basic financial literacy. These questions are similar to the 2004 HRS and the questions on the 2009 and 2012 NFCS. There are 8 questions that assess advanced financial literacy. Finally, the study asks respondents to rate their own financial literacy on a scale of 1-7 with 1 being low understanding and 7 being a high understanding of financial literacy.

*Peng, Bartholomae, Fox, and Cravener (2007)*

(investment knowledge measure) Ten-question investment knowledge test covering issues related to personal investing.

*Mandell and Klein (2009)*

2004 Jump$tart questionnaire of about 50 questions with 31 being core financial literacy questions. There are four key areas of coverage: (1) income, (2) money management, (3) saving and investing, and (4) spending and credit.

*Lusardi and Mitchell (2008)*

2004 Health and Retirement Survey. 3 questions about financially literacy (3 of the 5 questions from the NFCS)

*Mandell (2008)*

1997-2006 Jump$tart Surveys with about 50 questions with 31 being core financial literacy questions. There are four key areas of coverage: (1) income, (2) money management, (3) saving and investing, and (4) spending and credit.

*Mandell and Klein (2007)*

Jump$tart Surveys with about 50 questions with 31 being core financial literacy questions. There are four key areas of coverage: (1) income, (2) money management, (3) saving and investing, and (4) spending and credit.

*Lusardi and Mitchell (2007)*

Five basic financial literacy questions and 8 sophisticated financial literacy questions. The basic questions based on questions similar to those developed for the Health and Retirement Study (HRS). The sophisticated questions are similar to the DNB Household Survey.

*Danes and Haberman (2007)*

Post-then-pre technique using High School Financial Planning Program (HSFPP) curriculum to measure financial literacy. Four knowledge questions and one self-efficacy questions were asked on a 5-point Likert scale from strongly disagree (1) to strongly agree (5)

*Borden et al. (2007)*

Credit Wise Cats curriculum with a pre- and post-test. Financial knowledge score based on 7 items that students had to decide if the item reflected good financial management practices.

*Lyons, Rachlis, and Scherpf (2007)*

Out of the 58 survey questions 23 questions tested consumer knowledge of credit reporting issues. Most questions were multiple-choice style with a few being open ended questions. The credit knowledge test included questions about credit reports, credit scores, and the dispute resolution process.

*Zhan, Anderson, and Scott (2006)*

Pre and Post-test with 48 true-false and multiple choice questions in 5 content areas: (1) predatory lending, (2) public and work-related benefits, (3) banking practices, (4) saving and investing, and (5) credit use and interest rates.

*Varcoe et al. (2005)*

Pre and post-test using 19 true/false questions assessing knowledge.

*Hira and Loibl (2005)*

4 Questions rated on a 5-item Likert scale ranging from *strongly disagree=1* to *strongly agree=5*. Questions included: (1) I have a very clear idea of my financial needs during retirement, (2) I have a better understanding now of how to invest my money than I did six months ago, (3) I feel more informed now about hot to provide for my financial future than I did six months ago, and (4) I have a better understanding now of how to manage my credit use than I did six months ago.

*Hilgert, Hogarth, and Beverly (2003)*

28 True/False questions that were part of the Surveys of Consumers. Topics covered include cash-flow management, general credit management, saving, investment, mortgages, and other financial-management topics.

*Tennyson and Nguyen (2001)*

Jump$tart Surveys with about 50 questions with 31 being core financial literacy questions. There are four key areas of coverage: (1) income, (2) money management, (3) saving and investing, and (4) spending and credit.

*Danes, Huddleston-Casas, and Boyce (1999)*

Post-then-pre technique using High School Financial Planning Program (HSFPP) curriculum to measure financial literacy. Students were asked 8 questions about their financial behaviors, 3 questions about financial knowledge, and 2 self-efficacy questions. The questions were answered on a 5-point Likert scale from 1) almost never to 5) almost always.

*Volpe, Chen, and Pavlicko (1996)*

(measure investment literacy) "What is your Investing IQ?" from Money Forecast issue of *Money* magazine. There were 10 questions, each question worth 10 points. Scores higher than 70 were considered knowledgeable about personal investment. Scores less than 40 were considered failing.

Table 3.1: 2009 and 2012 NFCS Descriptive Statistics

| | (1) 2009 NFCS Descriptive Statistics | | | (2) 2012 NFCS Descriptive Statistics | | |
|---|---|---|---|---|---|---|
| | Count | Mean | Std. Dev. | Count | Mean | Std. Dev. |
| Male | 28146 | 0.4867 | 0.4998 | 25509 | 0.4858 | 0.4998 |
| 18-24 | 28146 | 0.1352 | 0.3419 | 25509 | 0.1231 | 0.3285 |
| 25-34 | 28146 | 0.1708 | 0.3764 | 25509 | 0.1830 | 0.3867 |
| 35-44 | 28146 | 0.1828 | 0.3865 | 25509 | 0.1635 | 0.3698 |
| 45=54 | 28146 | 0.1960 | 0.3970 | 25509 | 0.1962 | 0.3971 |
| 55-64 | 28146 | 0.1631 | 0.3695 | 25509 | 0.1791 | 0.3835 |
| 65+ | 28146 | 0.1520 | 0.3591 | 25509 | 0.1551 | 0.3620 |
| Less than High School | 28146 | 0.0348 | 0.1834 | 25509 | 0.0867 | 0.2813 |
| High School | 28146 | 0.2932 | 0.4552 | 25509 | 0.2945 | 0.4558 |
| Some College | 28146 | 0.1586 | 0.3653 | 25509 | 0.3591 | 0.4797 |
| College | 28146 | 0.1586 | 0.3653 | 25509 | 0.1609 | 0.3675 |
| Post Grad Education | 28146 | 0.0940 | 0.2918 | 25509 | 0.0988 | 0.2983 |
| Married | 28146 | 0.5337 | 0.4989 | 25509 | 0.5403 | 0.4984 |
| Single | 28146 | 0.2824 | 0.4502 | 25509 | 0.2928 | 0.4551 |
| Divorced/Separated | 28146 | 0.1398 | 0.3467 | 25509 | 0.1283 | 0.3345 |
| Widow/Widower | 28146 | 0.0441 | 0.2054 | 25509 | 0.0386 | 0.1926 |
| Number of Children | 28146 | 0.7351 | 1.1030 | 25509 | 0.7368 | 1.0955 |
| Less than $25k | 28146 | 0.2778 | 0.4479 | 25509 | 0.2650 | 0.4414 |
| $25-50k | 28146 | 0.2908 | 0.4541 | 25509 | 0.2625 | 0.4400 |
| $50-75k | 28146 | 0.1872 | 0.3901 | 25509 | 0.1882 | 0.3909 |
| $75-150k | 28146 | 0.1956 | 0.3966 | 25509 | 0.2229 | 0.4162 |
| $150k+ | 28146 | 0.0486 | 0.2151 | 25509 | 0.0613 | 0.2399 |
| Self Employed | 28146 | 0.0807 | 0.2724 | 25509 | 0.0758 | 0.2647 |
| Employed | 28146 | 0.4587 | 0.4983 | 25509 | 0.4507 | 0.4976 |
| Not in Labor Force | 28146 | 0.1901 | 0.3924 | 25509 | 0.2072 | 0.4053 |
| Unemployed | 28146 | 0.0980 | 0.2973 | 25509 | 0.0911 | 0.2878 |
| Retired | 28146 | 0.1725 | 0.3778 | 25509 | 0.1752 | 0.3801 |
| White Alone | 28146 | 0.6851 | 0.4645 | 25509 | 0.6647 | 0.4721 |
| Financial Literacy Score | 28146 | 2.9885 | 1.4427 | 25509 | 2.8781 | 1.4656 |
| Observations | 28146 | | | 25509 | | |

Table 3.2: Financial Literacy Questions

| Topic | Question from the NFCS<br>(Correct Answers Bolded) |
|---|---|
| Interest | Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years how much do you think you would have in the account if you left the money grow?<br>**1. More than $102**<br>2. Exactly $102<br>3. Less than $102<br>4. Don't Know<br>5. Prefer not to say |
| Inflation | Image that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year how much would you be able to buy with the money in the account?<br>1. More than today<br>2. Exactly the same<br>**3. Less than today**<br>4. Don't know<br>5. Prefer not to say |
| Bond | If interest rates rise, what will typically happen to bond prices?<br>1. They will rise<br>**2. They will fall**<br>3. They will stay the same<br>4. There is not relationship between bond prices and the interest rate<br>5. Don't know<br>6. Prefer not to say |
| Mortgage | A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less.<br>**1. True**<br>2. False<br>3. Don't know<br>4. Prefer not to say |
| Stock | Buying a single company's stock usually provides a safer return than a stock mutual fund.<br>1. True<br>**2. False**<br>3. Don't know<br>4. Prefer not to say |

Table 3.3: 2012 Financial Education Course Descriptive Statistics

| | count | mean | sd |
|---|---|---|---|
| HS Course Only | 22858 | 0.0415 | 0.1994 |
| College Course Only | 22858 | 0.0406 | 0.1973 |
| Employer Course Only | 22858 | 0.0272 | 0.1628 |
| HS & College Course Only | 22858 | 0.0270 | 0.1621 |
| HS & Employer Course Only | 22858 | 0.0179 | 0.1327 |
| College & Employer Course Only | 22858 | 0.0242 | 0.1536 |
| HS, College, & Employer Course | 22858 | 0.0291 | 0.1680 |
| No Fin. Lit. Course | 22858 | 0.7926 | 0.4055 |
| Observations | 25509 | | |

Table 4.1: Mean Financial Literacy Scores by Course

| Type of Course | Course | | No Course | | | |
|---|---|---|---|---|---|---|
| | n | Mean | n | Mean | Total n | Signif. |
| HS only | 918 | 2.84 | 17,745 | 2.83 | 18,663 | |
| College only | 1061 | 3.36 | 17,745 | 2.83 | 18,806 | *** |
| Employer only | 670 | 3.58 | 17,745 | 2.83 | 18,415 | *** |
| HS and Coll | 678 | 3.55 | 17,745 | 2.83 | 18.423 | *** |
| HS and Empl | 395 | 3.19 | 17,745 | 2.83 | 18,140 | *** |
| Coll and Empl | 633 | 3.81 | 17,745 | 2.83 | 18,378 | *** |
| HS, Coll, Empl | 758 | 3.53 | 17,745 | 2.83 | 18,503 | *** |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.2: Low Education Mean Financial Literacy Score by Course

| Type of Course | Course | | No Course | | | |
|---|---|---|---|---|---|---|
| | n | Mean | n | Mean | Total n | Signif. |
| HS only | 503 | 2.6322 | 6715 | 2.3510 | 7218 | *** |
| Employer Only | 122 | 3.0069 | 6715 | 2.3510 | 6837 | *** |
| HS and Employer | 178 | 2.9145 | 6715 | 2.3510 | 6893 | *** |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.3: High Education Mean Financial Literacy Scores by Course

| Type of Course | Course | | No Course | | | |
|---|---|---|---|---|---|---|
| | n | Mean | n | Mean | Total n | Signif. |
| HS only | 380 | 3.1014 | 9004 | 3.1010 | 9384 | |
| College only | 831 | 3.1937 | 9004 | 3.1010 | 9835 | |
| Employer only | 391 | 3.6639 | 9004 | 3.1010 | 9395 | *** |
| HS and Coll | 521 | 3.4301 | 9004 | 3.1010 | 9525 | *** |
| HS and Empl | 194 | 3.4275 | 9004 | 3.1010 | 9198 | *** |
| Coll and Empl | 435 | 3.6244 | 9004 | 3.1010 | 9439 | *** |
| HS, Coll, Empl | 564 | 3.4668 | 9004 | 3.1010 | 9568 | *** |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.4: Low Income Mean Financial Literacy Score by Course

| Type of Course | Course | | No Course | | | |
|---|---|---|---|---|---|---|
| | n | Mean | n | Mean | Total n | Signif. |
| HS only | 557 | 2.5629 | 9393 | 2.4177 | 9950 | *** |
| College only | 490 | 2.8895 | 9393 | 2.4177 | 9883 | *** |
| Employer only | 212 | 3.0886 | 9393 | 2.4177 | 9605 | *** |
| HS and Coll | 299 | 3.3221 | 9393 | 2.4177 | 9692 | *** |
| HS and Empl | 182 | 2.8717 | 9393 | 2.4177 | 9575 | *** |
| Coll and Empl | 160 | 3.8061 | 9393 | 2.4177 | 9553 | *** |
| HS, Coll, Empl | 206 | 3.2259 | 9393 | 2.4177 | 9599 | *** |

$^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$

Table 4.5: High Income Mean Financial Literacy Scores by Course

| Type of Course | Course | | No Course | | | |
|---|---|---|---|---|---|---|
| | n | Mean | n | Mean | Total n | Signif. |
| HS only | 361 | 3.2942 | 8352 | 3.3349 | 8713 | |
| College only | 571 | 3.7452 | 8352 | 3.3349 | 8923 | *** |
| Employer only | 458 | 3.8352 | 8352 | 3.3349 | 8810 | *** |
| HS and Coll | 379 | 3.7490 | 8352 | 3.3349 | 8731 | *** |
| HS and Empl | 213 | 3.4561 | 8352 | 3.3349 | 8565 | |
| Coll and Empl | 473 | 3.9106 | 8352 | 3.3349 | 8825 | *** |
| HS, Coll, Empl | 885 | 3.6512 | 8352 | 3.3349 | 8904 | *** |

$^{*}p < .1$, $^{**}p < .05$, $^{***}p < .01$

Table 4.6: Ordered Probit Predicted Probabilities

| | 0 Correct | 1 Correct | 2 Correct | 3 Correct | 4 Correct | 5 Correct |
|---|---|---|---|---|---|---|
| Male | -0.0310*** | -0.0514*** | -0.0541*** | -0.0077*** | 0.0740*** | 0.0702*** |
| | (0.002) | (0.003) | (0.003) | (0.001) | (0.004) | (0.003) |
| White Alone | -0.0195*** | -0.0313*** | -0.0314*** | -0.0022*** | 0.0451*** | 0.0393*** |
| | (0.002) | (0.003) | (0.003) | (0.001) | (0.004) | (0.004) |
| Single | 0.0018 | 0.0030 | 0.0032 | 0.0004 | -0.0044 | -0.0040 |
| | (0.002) | (0.004) | (0.004) | (0.000) | (0.005) | (0.005) |
| Divorced/Separated | 0.0023 | 0.0038 | 0.0039 | 0.0005 | -0.0055 | -0.0050 |
| | (0.002) | (0.004) | (0.004) | (0.000) | (0.005) | (0.005) |
| Widowed/Widower | 0.0107** | 0.0169*** | 0.0166*** | 0.0006 | -0.0243*** | -0.0204*** |
| | (0.004) | (0.006) | (0.006) | (0.001) | (0.009) | (0.007) |
| Self Employed | -0.0057** | -0.0100** | -0.0110** | -0.0021* | 0.0145** | 0.0143** |
| | (0.002) | (0.004) | (0.005) | (0.001) | (0.006) | (0.007) |
| Not in Labor Force | 0.0008 | 0.0013 | 0.0014 | 0.0002 | -0.0019 | -0.0018 |
| | (0.002) | (0.003) | (0.003) | (0.000) | (0.005) | (0.004) |
| Unemployed | 0.0010 | 0.0017 | 0.0018 | 0.0002 | -0.0025 | -0.0023 |
| | (0.003) | (0.005) | (0.005) | (0.001) | (0.007) | (0.006) |
| Retired | 0.0007 | 0.0012 | 0.0013 | 0.0002 | -0.0018 | -0.0017 |
| | (0.003) | (0.004) | (0.004) | (0.001) | (0.006) | (0.006) |
| Number of Children | 0.0021*** | 0.0036*** | 0.0038*** | 0.0005*** | -0.0052*** | -0.0048*** |
| | (0.001) | (0.001) | (0.001) | (0.000) | (0.002) | (0.002) |
| 18-24 | 0.1042*** | 0.1160*** | 0.0764*** | -0.0409*** | -0.1582*** | -0.0974*** |
| | (0.010) | (0.007) | (0.003) | (0.006) | (0.009) | (0.004) |
| 25-34 | 0.0769*** | 0.0969*** | 0.0747*** | -0.0216*** | -0.1345*** | -0.0925*** |
| | (0.007) | (0.006) | (0.003) | (0.004) | (0.008) | (0.005) |
| 35-44 | 0.0458*** | 0.0638*** | 0.0545*** | -0.0082*** | -0.0899*** | -0.0660*** |
| | (0.005) | (0.006) | (0.004) | (0.002) | (0.008) | (0.005) |
| 45-54 | 0.0236*** | 0.0362*** | 0.0344*** | -0.0001 | -0.0518*** | -0.0422*** |
| | (0.004) | (0.005) | (0.005) | (0.001) | (0.007) | (0.005) |
| 55-64 | 0.0149*** | 0.0236*** | 0.0232*** | 0.0009* | -0.0340*** | -0.0287*** |
| | (0.003) | (0.005) | (0.004) | (0.000) | (0.007) | (0.005) |
| Less than $25k | 0.0604*** | 0.0835*** | 0.0718*** | -0.0093*** | -0.1174*** | -0.0890*** |
| | (0.004) | (0.005) | (0.003) | (0.002) | (0.006) | (0.004) |
| $25-50k | 0.0338*** | 0.0509*** | 0.0478*** | -0.0009 | -0.0727*** | -0.0589*** |
| | (0.003) | (0.004) | (0.003) | (0.001) | (0.006) | (0.004) |

| | | | | | | |
|---|---|---|---|---|---|---|
| $50-75k | 0.0148*** | 0.0234*** | 0.0231*** | 0.0010** | -0.0337*** | -0.0286*** |
| | (0.003) | (0.004) | (0.004) | (0.000) | (0.006) | (0.004) |
| $150k+ | -0.0118*** | -0.0213*** | -0.0245*** | -0.0063** | 0.0309*** | 0.0329*** |
| | (0.003) | (0.005) | (0.006) | (0.002) | (0.008) | (0.009) |
| Less than high school | 0.1138*** | 0.1202*** | 0.0734*** | -0.0490*** | -0.1631*** | -0.0955*** |
| | (0.009) | (0.006) | (0.002) | (0.005) | (0.007) | (0.003) |
| High School | 0.0535*** | 0.0768*** | 0.0690*** | -0.0048*** | -0.1086*** | -0.0859*** |
| | (0.004) | (0.004) | (0.003) | (0.002) | (0.006) | (0.004) |
| Some College | 0.0179*** | 0.0289*** | 0.0293*** | 0.0025*** | -0.0417*** | -0.0368*** |
| | (0.002) | (0.004) | (0.003) | (0.001) | (0.005) | (0.004) |
| Post Grad Education | -0.0127*** | -0.0229*** | -0.0263*** | -0.0067*** | 0.0332*** | 0.0353*** |
| | (0.002) | (0.004) | (0.005) | (0.002) | (0.006) | (0.007) |
| HS Course Only | -0.0168*** | -0.0316*** | -0.0382*** | -0.0125*** | 0.0456*** | 0.0534*** |
| | (0.002) | (0.004) | (0.006) | (0.003) | (0.006) | (0.009) |
| College Course Only | -0.0158*** | -0.0296*** | -0.0354*** | -0.0111*** | 0.0428*** | 0.0492*** |
| | (0.002) | (0.005) | (0.007) | (0.003) | (0.007) | (0.011) |
| Employer Course Only | -0.0201*** | -0.0391*** | -0.0491*** | -0.0188*** | 0.0560*** | 0.0711*** |
| | (0.002) | (0.005) | (0.008) | (0.005) | (0.007) | (0.013) |
| HS & College Course Only | -0.0217*** | -0.0430*** | -0.0549*** | -0.0225*** | 0.0611*** | 0.0810*** |
| | (0.002) | (0.005) | (0.008) | (0.005) | (0.007) | (0.014) |
| HS & Employer Course Only | -0.0169*** | -0.0321*** | -0.0391*** | -0.0133*** | 0.0462*** | 0.0551*** |
| | (0.003) | (0.007) | (0.009) | (0.005) | (0.009) | (0.014) |
| College & Employer Course Only | -0.0211*** | -0.0415*** | -0.0528*** | -0.0212*** | 0.0592*** | 0.0774*** |
| | (0.003) | (0.006) | (0.009) | (0.006) | (0.008) | (0.016) |
| HS, College, & Employer Course | -0.0104*** | -0.0187*** | -0.0214*** | -0.0053* | 0.0271*** | 0.0287** |
| | (0.003) | (0.006) | (0.008) | (0.003) | (0.009) | (0.011) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .0933 | .0933 | .0933 | .0933 | .0933 | .0933 |
| Observations | 22858 | 22858 | 22858 | 22858 | 22858 | 22858 |

Standard errors in parentheses; * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.7: Ordered Probit Predicted Probabilities Split by Education

| | 0 Correct | 1 Correct | 2 Correct | 3 Correct | 4 Correct | 5 Correct |
|---|---|---|---|---|---|---|
| Panel A: Low Education | | | | | | |
| HS Course Only | -0.0413*** | -0.0526*** | -0.0333*** | 0.0229*** | 0.0692*** | 0.0351*** |
| | (0.006) | (0.008) | (0.007) | (0.002) | (0.011) | (0.007) |
| Employer Course Only | -0.0411*** | -0.0536*** | -0.0352** | 0.0218*** | 0.0710*** | 0.0371** |
| | (0.010) | (0.016) | (0.014) | (0.003) | (0.023) | (0.015) |
| HS & Employer Course Only | -0.0434*** | -0.0572*** | -0.0382*** | 0.0225*** | 0.0760*** | 0.0403*** |
| | (0.008) | (0.013) | (0.011) | (0.002) | (0.018) | (0.012) |
| Pseudo $R^2$ | .0579 | .0579 | .0579 | .0579 | .0579 | .0579 |
| Observations | 7518 | 7518 | 7518 | 7518 | 7518 | 7518 |
| Panel B: High Education | | | | | | |
| HS Course Only | -0.0070** | -0.0145** | -0.0210** | -0.0114* | 0.0209** | 0.0330** |
| | (0.003) | (0.006) | (0.009) | (0.006) | (0.008) | (0.016) |
| College Course Only | -0.0107*** | -0.0226*** | -0.0337*** | -0.0199*** | 0.0320*** | 0.0548*** |
| | (0.002) | (0.005) | (0.008) | (0.006) | (0.006) | (0.014) |
| Employer Course Only | -0.0148*** | -0.0330*** | -0.0522*** | -0.0357*** | 0.0442*** | 0.0915*** |
| | (0.002) | (0.005) | (0.010) | (0.009) | (0.006) | (0.020) |
| HS & College Course Only | -0.0152*** | -0.0339*** | -0.0537*** | -0.0368*** | 0.0454*** | 0.0942*** |
| | (0.002) | (0.005) | (0.009) | (0.008) | (0.005) | (0.018) |
| HS & Employer Course Only | -0.0084** | -0.0176** | -0.0259** | -0.0148* | 0.0252** | 0.0415* |
| | (0.004) | (0.008) | (0.013) | (0.009) | (0.011) | (0.023) |
| College & Employer Course Only | -0.0131*** | -0.0287*** | -0.0445*** | -0.0288*** | 0.0395*** | 0.0757*** |
| | (0.002) | (0.006) | (0.010) | (0.009) | (0.007) | (0.020) |
| HS, College, & Employer Course | -0.0094*** | -0.0196*** | -0.0291*** | -0.0168** | 0.0280*** | 0.0468*** |
| | -0.0070** | -0.0145** | -0.0210** | -0.0114* | 0.0209** | 0.0330** |
| Pseudo $R^2$ | .0695 | .0695 | .0695 | .0695 | .0695 | .0695 |
| Observations | 12320 | 12320 | 12320 | 12320 | 12320 | 12320 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.8: Ordered Probit Predicted Probabilities Split by Income

| | 0 Correct | 1 Correct | 2 Correct | 3 Correct | 4 Correct | 5 Correct |
|---|---|---|---|---|---|---|
| Panel A: Low Income | | | | | | |
| HS Course Only | -0.0314*** | -0.0425*** | -0.0311*** | 0.0132*** | 0.0587*** | 0.0331*** |
| | (0.005) | (0.008) | (0.007) | (0.001) | (0.011) | (0.007) |
| College Course Only | -0.0255*** | -0.0337*** | -0.0237*** | 0.0117*** | 0.0462*** | 0.0251*** |
| | (0.007) | (0.010) | (0.008) | (0.002) | (0.014) | (0.009) |
| Employer Course Only | -0.0398*** | -0.0575*** | -0.0463*** | 0.0126*** | 0.0807*** | 0.0503*** |
| | (0.007) | (0.012) | (0.012) | (0.002) | (0.017) | (0.015) |
| HS & College Course Only | -0.0469*** | -0.0704*** | -0.0603*** | 0.0104*** | 0.0999*** | 0.0673*** |
| | (0.006) | (0.011) | (0.013) | (0.003) | (0.016) | (0.016) |
| HS & Employer Course Only | -0.0388*** | -0.0556*** | -0.0444*** | 0.0127*** | 0.0780*** | 0.0481*** |
| | (0.007) | (0.012) | (0.012) | (0.002) | (0.017) | (0.014) |
| College & Employer Course Only | -0.0499*** | -0.0774*** | -0.0694*** | 0.0070 | 0.1106*** | 0.0792*** |
| | (0.006) | (0.013) | (0.016) | (0.006) | (0.020) | (0.022) |
| HS, College, & Employer Course | -0.0298*** | -0.0406*** | -0.0299** | 0.0124*** | 0.0561*** | 0.0318** |
| | (0.009) | (0.015) | (0.013) | (0.002) | (0.021) | (0.014) |
| Pseudo $R^2$ | .0618 | .0618 | .0618 | .0618 | .0618 | .0618 |
| Observations | 11499 | 11499 | 11499 | 11499 | 11499 | 11499 |
| Panel B: High Income | | | | | | |
| HS Course Only | -0.0078*** | -0.0180*** | -0.0327*** | -0.0302*** | 0.0180*** | 0.0706*** |
| | (0.002) | (0.004) | (0.008) | (0.008) | (0.003) | (0.019) |
| College Course Only | -0.0087*** | -0.0203*** | -0.0372*** | -0.0350*** | 0.0196*** | 0.0816*** |
| | (0.002) | (0.004) | (0.008) | (0.009) | (0.003) | (0.021) |
| Employer Course Only | -0.0091*** | -0.0216*** | -0.0399*** | -0.0381*** | 0.0200*** | 0.0887*** |
| | (0.002) | (0.004) | (0.008) | (0.009) | (0.002) | (0.021) |
| HS & College Course Only | -0.0091*** | -0.0217*** | -0.0401*** | -0.0386*** | 0.0199*** | 0.0896*** |
| | (0.002) | (0.004) | (0.009) | (0.010) | (0.002) | (0.023) |
| HS & Employer Course Only | -0.0054** | -0.0122* | -0.0215* | -0.0188 | 0.0134** | 0.0446* |
| | (0.003) | (0.006) | (0.012) | (0.012) | (0.006) | (0.026) |
| College & Employer Course Only | -0.0089*** | -0.0209*** | -0.0385*** | -0.0366*** | 0.0197*** | 0.0852*** |
| | (0.002) | (0.005) | (0.009) | (0.011) | (0.002) | (0.024) |
| HS, College, & Employer Course | -0.0037* | -0.0082* | -0.0142 | -0.0118 | 0.0095* | 0.0285 |
| | (0.002) | (0.005) | (0.009) | (0.008) | (0.005) | (0.018) |
| Pseudo $R^2$ | .0747 | .0747 | .0747 | .0747 | .0747 | .0747 |
| Observations | 11359 | 11359 | 11359 | 11359 | 11359 | 11359 |

Standard errors in parentheses * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.9: Descriptive Statistics for each question by education

| | (1) Full Sample | | (2) Low Education | | (3) High Education | | Diff. between High and Low |
|---|---|---|---|---|---|---|---|
| | Count. | Mean | Count | Prop. | Count | Prop. | Signif. |
| Fin. Lit. Score | 25509 | 2.8781 | 8464 | 2.3205 | 13762 | 3.1206 | *** |
| Interest | 25509 | 0.7492 | 8464 | 0.6525 | 13762 | 0.7970 | *** |
| Inflation | 25509 | 0.6127 | 8464 | 0.4878 | 13762 | 0.6683 | *** |
| Bond | 25509 | 0.2810 | 8464 | 0.1949 | 13762 | 0.3101 | *** |
| Mortgage | 25509 | 0.7504 | 8464 | 0.6435 | 13762 | 0.8024 | *** |
| Stock | 25509 | 0.4848 | 8464 | 0.3419 | 13762 | 0.5427 | *** |
| Observations | 25509 | | 8464 | | 13762 | | |

$^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$

Table 4.10: Descriptive Statistics for each question by income

| | (1) Full Sample | | (2) Less than $50,000 | | (3) More than $50,000 | | Diff. between High and Low |
|---|---|---|---|---|---|---|---|
| | Count | Prop. | Count | Prop. | Count | Prop. | Signif. |
| Financial Literacy Score | 25509 | 2.8781 | 12999 | 2.4427 | 12510 | 3.3645 | *** |
| Interest | 25509 | 0.7492 | 12999 | 0.6827 | 12510 | 0.8235 | *** |
| Inflation | 25509 | 0.6127 | 12999 | 0.5206 | 12510 | 0.7157 | *** |
| Bond | 25509 | 0.2810 | 12999 | 0.2090 | 12510 | 0.3615 | *** |
| Mortgage | 25509 | 0.7504 | 12999 | 0.6583 | 12510 | 0.8533 | *** |
| Stock | 25509 | 0.4848 | 12999 | 0.3722 | 12510 | 0.6105 | *** |
| Observations | 25509 | | 12999 | | 12510 | | |

$^{*}$ $p < .1$, $^{**}$ $p < .05$, $^{***}$ $p < .01$

Table 4.11: Question Probit Model Results

| | (1) Interest | (2) Inflation | (3) Bond | (4) Mortgage | (5) Stock |
|---|---|---|---|---|---|
| Male | 0.0636*** | 0.1319*** | 0.0917*** | 0.0374*** | 0.1551*** |
| | (0.007) | (0.008) | (0.007) | (0.007) | (0.008) |
| White Alone | 0.0499*** | 0.0743*** | 0.0286*** | 0.0791*** | 0.0590*** |
| | (0.009) | (0.010) | (0.009) | (0.009) | (0.011) |
| Single | 0.0068 | -0.0017 | 0.0064 | -0.0300*** | -0.0104 |
| | (0.010) | (0.012) | (0.011) | (0.010) | (0.013) |
| Divorced/Separated | -0.0073 | -0.0088 | 0.0012 | -0.0076 | -0.0195 |
| | (0.011) | (0.013) | (0.012) | (0.011) | (0.013) |
| Widowed/Widower | -0.0330* | 0.0002 | -0.0260 | -0.0340* | -0.0544** |
| | (0.019) | (0.022) | (0.019) | (0.019) | (0.022) |
| Self Employed | 0.0164 | 0.0328** | 0.0074 | 0.0186 | 0.0240 |
| | (0.013) | (0.016) | (0.014) | (0.013) | (0.017) |
| Not in Labor Force | -0.0102 | 0.0229** | -0.0344*** | 0.0005 | 0.0033 |
| | (0.010) | (0.012) | (0.011) | (0.010) | (0.012) |
| Unemployed | 0.0028 | 0.0098 | -0.0305** | -0.0033 | 0.0067 |
| | (0.013) | (0.016) | (0.014) | (0.013) | (0.017) |
| Retired | -0.0279** | 0.0123 | -0.0103 | -0.0172 | 0.0264* |
| | (0.013) | (0.015) | (0.012) | (0.013) | (0.015) |
| Number of Children | -0.0026 | -0.0188*** | -0.0025 | 0.0039 | -0.0159*** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| 18-24 | -0.1347*** | -0.3750*** | -0.1236*** | -0.1417*** | -0.2124*** |
| | (0.022) | (0.021) | (0.016) | (0.023) | (0.021) |
| 25-34 | -0.1026*** | -0.3321*** | -0.1302*** | -0.0907*** | -0.1835*** |
| | (0.019) | (0.020) | (0.014) | (0.019) | (0.019) |
| 35-44 | -0.0655*** | -0.1958*** | -0.1077*** | -0.0741*** | -0.1132*** |
| | (0.018) | (0.020) | (0.014) | (0.018) | (0.019) |
| 45-54 | -0.0470*** | -0.0850*** | -0.0639*** | -0.0309** | -0.0920*** |
| | (0.016) | (0.019) | (0.013) | (0.015) | (0.017) |
| 55-64 | -0.0323** | -0.0387** | -0.0535*** | -0.0157 | -0.0637*** |
| | (0.014) | (0.016) | (0.012) | (0.013) | (0.015) |
| Less than $25k | -0.1112*** | -0.1366*** | -0.1103*** | -0.1757*** | -0.1898*** |
| | (0.013) | (0.015) | (0.011) | (0.014) | (0.014) |
| $25-50k | -0.0741*** | -0.0746*** | -0.0754*** | -0.0919*** | -0.1320*** |

| | | | | | |
|---|---|---|---|---|---|
| | (0.011) | (0.013) | (0.010) | (0.012) | (0.012) |
| $50-75k | -0.0336*** | -0.0266** | -0.0488*** | -0.0177 | -0.0675*** |
| | (0.012) | (0.013) | (0.010) | (0.012) | (0.013) |
| $150k+ | 0.0236 | 0.0337* | 0.0533*** | -0.0019 | 0.0631*** |
| | (0.017) | (0.019) | (0.016) | (0.018) | (0.019) |
| Less than high school | -0.1968*** | -0.2595*** | -0.1210*** | -0.2079*** | -0.2387*** |
| | (0.019) | (0.019) | (0.014) | (0.019) | (0.017) |
| High School | -0.1089*** | -0.1738*** | -0.1097*** | -0.0970*** | -0.1830*** |
| | (0.012) | (0.013) | (0.010) | (0.012) | (0.013) |
| Some College | -0.0372*** | -0.0627*** | -0.0638*** | -0.0141 | -0.0724*** |
| | (0.011) | (0.012) | (0.010) | (0.011) | (0.012) |
| Post Grad Education | 0.0222 | 0.0604*** | 0.0261** | 0.0410*** | 0.0719*** |
| | (0.014) | (0.015) | (0.013) | (0.013) | (0.016) |
| HS Course Only | 0.0792*** | 0.1000*** | -0.0041 | 0.0616*** | 0.0734*** |
| | (0.014) | (0.018) | (0.019) | (0.014) | (0.021) |
| College Course Only | 0.0696*** | 0.0541*** | 0.0732*** | 0.0235 | 0.0583*** |
| | (0.015) | (0.020) | (0.019) | (0.017) | (0.021) |
| Employer Course Only | 0.0357* | 0.0637*** | 0.0857*** | 0.0753*** | 0.1640*** |
| | (0.020) | (0.024) | (0.024) | (0.019) | (0.025) |
| HS & College Course Only | 0.0824*** | 0.0780*** | 0.0766*** | 0.0827*** | 0.1241*** |
| | (0.018) | (0.024) | (0.023) | (0.019) | (0.025) |
| HS & Employer Course Only | 0.0557** | 0.0602** | 0.0544* | 0.0728*** | 0.0901*** |
| | (0.023) | (0.028) | (0.031) | (0.022) | (0.031) |
| College & Employer Course Only | 0.0554** | 0.0444* | 0.0970*** | 0.0919*** | 0.1113*** |
| | (0.022) | (0.027) | (0.024) | (0.020) | (0.027) |
| HS, College, & Employer Course | 0.0011 | -0.0130 | 0.0488** | 0.0683*** | 0.0653*** |
| | (0.021) | (0.024) | (0.021) | (0.018) | (0.025) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .0425 | .1123 | .0390 | .0819 | .0621 |
| Observations | 22858 | 22858 | 22858 | 22858 | 22858 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.12: Question Probit Model Results Split by Education

| | (1) Interest | (2) Inflation | (3) Bond | (4) Mortgage | (5) Stock |
|---|---|---|---|---|---|
| Panel A: Low Education | | | | | |
| HS Course Only | 0.1265*** | 0.1296*** | -0.0129 | 0.1185*** | 0.0815*** |
| | (0.022) | (0.028) | (0.021) | (0.023) | (0.028) |
| Employer Course Only | 0.0121 | 0.0015 | 0.1197** | 0.1324*** | 0.1872*** |
| | (0.052) | (0.055) | (0.052) | (0.047) | (0.056) |
| HS & Employer Course Only | 0.1253*** | 0.0654 | 0.1033** | 0.1352*** | 0.0710 |
| | (0.036) | (0.046) | (0.043) | (0.038) | (0.044) |
| Pseudo $R^2$ | .0394 | .1104 | .0385 | .0765 | .0598 |
| Observations | 7518 | 7518 | 7518 | 7518 | 7518 |
| Panel B: High Education | | | | | |
| HS Course Only | 0.0381* | 0.0680** | 0.0015 | 0.0142 | 0.0440 |
| | (0.021) | (0.027) | (0.029) | (0.023) | (0.031) |
| College Course Only | 0.0625*** | 0.0492** | 0.0783*** | 0.0081 | 0.0473** |
| | (0.015) | (0.020) | (0.023) | (0.017) | (0.023) |
| Employer Course Only | 0.0350 | 0.0763*** | 0.1060*** | 0.0500** | 0.1566*** |
| | (0.023) | (0.029) | (0.032) | (0.023) | (0.030) |
| HS & College Course Only | 0.0682*** | 0.0705*** | 0.0748*** | 0.0710*** | 0.1236*** |
| | (0.018) | (0.024) | (0.027) | (0.017) | (0.027) |
| HS & Employer Course Only | 0.0114 | 0.0648* | -0.0029 | 0.0395 | 0.1097*** |
| | (0.034) | (0.038) | (0.041) | (0.030) | (0.042) |
| College & Employer Course Only | 0.0592*** | 0.0418 | 0.0675** | 0.0735*** | 0.0850*** |
| | (0.021) | (0.029) | (0.030) | (0.019) | (0.031) |
| HS, College, & Employer Course | 0.0063 | 0.0038 | 0.0639** | 0.0597*** | 0.0768*** |
| | (0.021) | (0.025) | (0.026) | (0.018) | (0.027) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .0465 | .1136 | .0530 | .0769 | .0944 |
| Observations | 12320 | 12320 | 12320 | 12320 | 12320 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.13: Question Probit Model Results Split by Income

| | (1) Interest | (2) Inflation | (3) Bond | (4) Mortgage | (5) Stock |
|---|---|---|---|---|---|
| Panel A: Low Income | | | | | |
| HS Course Only | 0.1078*** | 0.0995*** | -0.0090 | 0.0835*** | 0.0730*** |
| | (0.025) | (0.028) | (0.021) | (0.026) | (0.026) |
| College Course Only | 0.0832*** | 0.0566* | 0.0555** | 0.0228 | 0.0384 |
| | (0.028) | (0.031) | (0.022) | (0.029) | (0.029) |
| Employer Course Only | 0.0364 | 0.0472 | 0.1022*** | 0.0968** | 0.1880*** |
| | (0.040) | (0.045) | (0.034) | (0.046) | (0.042) |
| HS & College Course Only | 0.1169*** | 0.0998** | 0.0803*** | 0.1609*** | 0.1418*** |
| | (0.039) | (0.040) | (0.027) | (0.042) | (0.037) |
| HS & Employer Course Only | 0.1126*** | 0.0498 | 0.0565 | 0.1433*** | 0.1207*** |
| | (0.043) | (0.046) | (0.036) | (0.047) | (0.043) |
| College & Employer Course Only | 0.1160** | 0.1185** | 0.1118*** | 0.2133*** | 0.1160** |
| | (0.051) | (0.057) | (0.037) | (0.053) | (0.051) |
| HS, College, & Employer Course | 0.0348 | 0.0226 | 0.0505 | 0.1108** | 0.1117** |
| | (0.044) | (0.044) | (0.032) | (0.047) | (0.043) |
| Pseudo $R^2$ | .0441 | .1129 | .0394 | .0675 | .0738 |
| Observations | 11499 | 11499 | 11499 | 11499 | 11499 |
| Panel B: High Income | | | | | |
| HS Course Only | 0.0633*** | 0.1065*** | 0.0052 | 0.0458** | 0.0653** |
| | (0.024) | (0.029) | (0.032) | (0.021) | (0.031) |
| College Course Only | 0.0672*** | 0.0488* | 0.0841*** | 0.0229 | 0.0757*** |
| | (0.024) | (0.026) | (0.026) | (0.019) | (0.028) |
| Employer Course Only | 0.0306 | 0.0683** | 0.0653** | 0.0587** | 0.1435*** |
| | (0.024) | (0.028) | (0.028) | (0.024) | (0.032) |
| HS & College Course Only | 0.0743*** | 0.0575* | 0.0671** | 0.0396 | 0.1015*** |
| | (0.028) | (0.031) | (0.030) | (0.025) | (0.033) |
| HS & Employer Course Only | 0.0162 | 0.0581 | 0.0420 | 0.0272 | 0.0490 |
| | (0.030) | (0.037) | (0.044) | (0.028) | (0.041) |
| College & Employer Course Only | 0.0287 | 0.0143 | 0.0869*** | 0.0533** | 0.1018*** |
| | (0.025) | (0.028) | (0.028) | (0.024) | (0.032) |
| HS, College, & Employer Course | -0.0112 | -0.0247 | 0.0467* | 0.0493** | 0.0407 |
| | (0.020) | (0.024) | (0.026) | (0.021) | (0.028) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .0608 | .1202 | .0630 | .0773 | .0994 |
| Observations | 11359 | 11359 | 11359 | 11359 | 11359 |

Standard errors in parentheses * $p < .1$, ** $p < .05$, *** $p < .01$

Table 5.1: Short-Term Financial Behaviors

| | Question from the NFCS |
|---|---|
| Paying bills | In a typical month, how difficult is it for you to cover your expenses and pay all your bills?<br>1. Very difficult<br>2. Somewhat difficult<br>3. Not at all difficult<br>4. Don't know<br>5. Prefer not to say |
| Checking Account | Do you [Does your household] have a checking account?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |
| Pay CC in Full | In the past 12 months, which of the following describes your experience with credit cards? – I always paid my credit cards in full.<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |

Table 5.2: Short-Term Behavior Descriptive Statistics by Education

| | (1) Full Sample | | (2) Low Education | | (3) High Education | | Diff (High-Low) |
|---|---|---|---|---|---|---|---|
| | Count | Mean. | Count | Mean | Count | Mean | Signif. |
| Not Difficult to Pay bills | 24995 | 0.4101 | 8205 | 0.3191 | 13544 | 0.4389 | *** |
| Has Checking Account | 25099 | 0.9031 | 8243 | 0.8254 | 13596 | 0.9441 | *** |
| Pays CC in Full | 18356 | 0.4999 | 4698 | 0.4495 | 10629 | 0.4864 | *** |
| Observations | 25445 | | 8436 | | 13734 | | |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5.3: Short-Term Behavior Descriptive Statistics by Income

| | (1) Full Sample | | (2) Less than $50,000 | | (3) More than $50,000 | | Diff (High-Low) |
|---|---|---|---|---|---|---|---|
| | Count | Mean | Count | Mean | Count | Mean | Signif |
| Not Difficult to Pay bills | 24995 | 0.4101 | 12683 | 0.2583 | 12312 | 0.5781 | *** |
| Has Checking Account | 25099 | 0.9031 | 12703 | 0.8378 | 12396 | 0.9750 | *** |
| Pays CC in Full | 18356 | 0.4999 | 7282 | 0.4245 | 11074 | 0.5521 | *** |
| Observations | 25445 | | 12963 | | 12482 | | |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5.4: Short-Term Financial Behaviors Probit Results

| | (1) Pays Bills | (2) Has Checking Account | (3) Pays CC in Full |
|---|---|---|---|
| Male | 0.0366*** | -0.0111*** | 0.0568*** |
| | (0.009) | (0.003) | (0.010) |
| White Alone | 0.0013 | 0.0088** | 0.0242* |
| | (0.011) | (0.004) | (0.013) |
| Single | 0.0148 | -0.0366*** | 0.0160 |
| | (0.013) | (0.006) | (0.015) |
| Divorced/Separated | -0.0345*** | -0.0373*** | -0.0458*** |
| | (0.013) | (0.007) | (0.016) |
| Widowed/Widower | -0.0218 | -0.0225* | -0.0112 |
| | (0.021) | (0.013) | (0.025) |
| Self Employed | -0.0319** | -0.0140** | 0.0842*** |
| | (0.016) | (0.007) | (0.018) |
| Not in Labor Force | 0.0085 | -0.0199*** | 0.0540*** |
| | (0.012) | (0.005) | (0.015) |
| Unemployed | -0.1071*** | -0.0631*** | -0.0211 |
| | (0.017) | (0.009) | (0.024) |
| Retired | 0.0822*** | -0.0088 | 0.1250*** |
| | (0.015) | (0.008) | (0.016) |
| Number of Children | -0.0623*** | -0.0062*** | -0.0368*** |
| | (0.005) | (0.002) | (0.005) |
| 18-24 | -0.0760*** | -0.1109*** | 0.0966*** |
| | (0.022) | (0.022) | (0.027) |
| 25-34 | -0.1103*** | -0.0985*** | -0.0654*** |
| | (0.018) | (0.019) | (0.022) |
| 35-44 | -0.1124*** | -0.1043*** | -0.1600*** |
| | (0.017) | (0.020) | (0.020) |
| 45-54 | -0.1339*** | -0.0707*** | -0.1704*** |
| | (0.015) | (0.015) | (0.018) |
| 55-64 | -0.0930*** | -0.0496*** | -0.1504*** |
| | (0.014) | (0.013) | (0.016) |
| Less than $25k | -0.3631*** | -0.1179*** | -0.1519*** |
| | (0.011) | (0.012) | (0.018) |
| $25-50k | -0.2615*** | -0.0538*** | -0.1459*** |
| | (0.010) | (0.009) | (0.014) |
| $50-75k | -0.1349*** | -0.0218** | -0.0889*** |
| | (0.011) | (0.009) | (0.014) |
| $150k+ | 0.1584*** | -0.0160 | 0.0889*** |
| | (0.019) | (0.014) | (0.018) |

| | | | |
|---|---|---|---|
| Less than high school | -0.1165*** | -0.1173*** | -0.1139*** |
| | (0.019) | (0.016) | (0.028) |
| High School | -0.0393*** | -0.0409*** | -0.0944*** |
| | (0.013) | (0.007) | (0.015) |
| Some College | -0.0552*** | -0.0143** | -0.1289*** |
| | (0.012) | (0.006) | (0.013) |
| Post Grad Education | -0.0051 | 0.0053 | 0.0869*** |
| | (0.014) | (0.008) | (0.015) |
| HS Course Only | 0.0323 | 0.0060 | 0.0156 |
| | (0.021) | (0.006) | (0.026) |
| College Course Only | 0.0103 | 0.0045 | -0.0582** |
| | (0.020) | (0.008) | (0.023) |
| Employer Course Only | 0.0664** | 0.0156 | -0.0278 |
| | (0.026) | (0.010) | (0.028) |
| HS & College Course Only | -0.0008 | -0.0355** | 0.0116 |
| | (0.024) | (0.016) | (0.028) |
| HS & Employer Course Only | 0.0353 | 0.0066 | 0.0385 |
| | (0.031) | (0.011) | (0.034) |
| College & Employer Course Only | 0.0320 | -0.0175 | -0.0121 |
| | (0.026) | (0.015) | (0.027) |
| HS, College, & Employer Course | 0.0320 | 0.0008 | 0.0905*** |
| | (0.023) | (0.011) | (0.025) |
| Financial Literacy Score | 0.0159*** | 0.0111*** | 0.0067* |
| | (0.003) | (0.001) | (0.004) |
| State Fixed Effects | Yes | Yes | Yes |
| Pseudo $R^2$ | .1516 | .2516 | .0868 |
| Observations | 22545 | 22634 | 16748 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 5.5: Short-Term Financial Behaviors Split by Education

| | (1) Pays Bills | (2) Has Checking Account | (3) Pays CC in Full |
|---|---|---|---|
| Panel A: Low Education | | | |
| HS Course Only | 0.0438 | 0.0248* | 0.0863** |
| | (0.028) | (0.014) | (0.038) |
| Employer Course Only | 0.0690 | 0.0653*** | -0.0181 |
| | (0.052) | (0.025) | (0.062) |
| HS & Employer Course Only | 0.0472 | 0.0335 | 0.1978*** |
| | (0.045) | (0.022) | (0.052) |
| Financial Literacy Score | -0.0010 | 0.0193*** | -0.0027 |
| | (0.005) | (0.003) | (0.007) |
| Pseudo $R^2$ | .1435 | .2324 | .0844 |
| Observations | 7358 | 7388 | 4268 |
| Panel B: High Education | | | |
| HS Course Only | 0.0265 | -0.0027 | -0.0538 |
| | (0.033) | (0.008) | (0.038) |
| College Course Only | 0.0165 | -0.0008 | -0.0662** |
| | (0.023) | (0.006) | (0.027) |
| Employer Course Only | 0.0908*** | 0.0008 | -0.0631* |
| | (0.034) | (0.011) | (0.037) |
| HS & College Course Only | -0.0066 | -0.0203*** | 0.0226 |
| | (0.029) | (0.007) | (0.032) |
| HS & Employer Course Only | 0.0260 | -0.0044 | -0.0855* |
| | (0.044) | (0.013) | (0.048) |
| College & Employer Course Only | 0.0326 | -0.0142* | -0.0284 |
| | (0.031) | (0.009) | (0.033) |
| HS, College, & Employer Course | 0.0279 | -0.0038 | 0.0996*** |
| | (0.027) | (0.008) | (0.030) |
| Financial Literacy Score | 0.0216*** | 0.0087*** | 0.0105* |
| | (0.005) | (0.001) | (0.005) |
| Pseudo $R^2$ | .1306 | .1843 | .0824 |
| Observations | 12193 | 12235 | 9671 |

Standard errors in parentheses * $p < .1$, ** $p < .05$, *** $p < .01$

Table 5.6: Short-Term Financial Behaviors Split by Income

| | (1) Pays Bills | (2) Has Checking Account | (3) Pays CC in Full |
|---|---|---|---|
| Panel A: Low Income | | | |
| HS Course Only | 0.0281 | 0.0182 | 0.0034 |
| | (0.024) | (0.014) | (0.038) |
| College Course Only | 0.0265 | -0.0036 | -0.0278 |
| | (0.025) | (0.022) | (0.036) |
| Employer Course Only | 0.0706* | 0.0595*** | 0.0257 |
| | (0.040) | (0.023) | (0.051) |
| HS & College Course Only | -0.0102 | -0.0541 | 0.0364 |
| | (0.029) | (0.035) | (0.044) |
| HS & Employer Course Only | 0.0415 | 0.0498** | 0.1456*** |
| | (0.039) | (0.019) | (0.054) |
| College & Employer Course Only | 0.0071 | -0.0757 | -0.0490 |
| | (0.040) | (0.048) | (0.057) |
| HS, College, & Employer Course | 0.0124 | -0.0118 | 0.0386 |
| | (0.034) | (0.036) | (0.049) |
| Financial Literacy Score | 0.0049 | 0.0198*** | 0.0031 |
| | (0.004) | (0.003) | (0.006) |
| Pseudo $R^2$ | .0702 | .1708 | .0574 |
| Observations | 11295 | 11323 | 6558 |
| Panel B: High Income | | | |
| HS Course Only | 0.0321 | -0.0007 | 0.0275 |
| | (0.032) | (0.004) | (0.035) |
| College Course Only | -0.0058 | 0.0043 | -0.0715** |
| | (0.028) | (0.003) | (0.030) |
| Employer Course Only | 0.0493* | -0.0033 | -0.0524 |
| | (0.029) | (0.006) | (0.032) |
| HS & College Course Only | 0.0111 | -0.0145 | -0.0036 |
| | (0.033) | (0.009) | (0.035) |
| HS & Employer Course Only | 0.0191 | -0.0136 | -0.0177 |
| | (0.040) | (0.011) | (0.043) |
| College & Employer Course Only | 0.0396 | 0.0008 | -0.0008 |
| | (0.030) | (0.004) | (0.031) |
| HS, College, & Employer Course | 0.0390 | 0.0021 | 0.1029*** |
| | (0.028) | (0.003) | (0.028) |
| Financial Literacy Score | 0.0246*** | 0.0042*** | 0.0089 |
| | (0.005) | (0.001) | (0.005) |
| Pseudo $R^2$ | .0911 | .2264 | .0974 |
| Observations | 11250 | 10912 | 10190 |

Standard errors in parentheses; * $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.1: Long-Term Financial Behaviors

| | Question from the NFCS |
|---|---|
| Figured Retirement | Have you ever tried to figure out how much you need to save for retirement?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say<br><br>Before you retired did you try to figure out how much you needed to save for retirement?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say<br><br>(Note: If a person responded yes to either, they were coded as a 1 that they figured out how much they needed for retirement.) |
| Emergency Fund | Have you set aside emergency or rainy day funds that would cover your expenses for 3 months, in case of sickness, job loss, economic downturn, or other emergencies?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |
| Savings Account | Do you have a savings account, money market account, or CDS?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |
| Non-employer Retirement | Do you [or your spouse/partner] have any other retirement accounts not through an employer, like and IRA, Keogh, SEP, or any other type of retirement account that you have set up yourself?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |
| Investments | Not including retirement accounts, do you [does your household] have any investments in stocks, bonds, mutual funds, or other securities?<br>1. Yes<br>2. No<br>3. Don't know<br>4. Prefer not to say |

Table 6.2: Long-Term Behavior Descriptive Statistics by Education

| | (1) Full Sample | | (2) Low Education | | (3) High Education | | Diff. between High and Low |
|---|---|---|---|---|---|---|---|
| | Count | Prop. | Count | Prop. | Count. | Prop. | Signif. |
| Emergency fund | 24497 | 0.4164 | 8051 | 0.3037 | 13276 | 0.4539 | *** |
| Has Savings Account | 25012 | 0.7403 | 8203 | 0.6005 | 13560 | 0.8082 | *** |
| Has Non-Retirement Investments | 23030 | 0.3636 | 7019 | 0.2312 | 12839 | 0.3959 | *** |
| Figure Retirement Amount | 19545 | 0.3859 | 6384 | 0.2494 | 10735 | 0.4376 | *** |
| Has Non-Employer Retirement Account | 24260 | 0.2907 | 7934 | 0.1682 | 13148 | 0.3245 | *** |
| Sum of LT Behaviors | 21626 | 2.3414 | 6468 | 1.7332 | 12132 | 2.5075 | *** |
| Observations | 25421 | | 8429 | | 13718 | | |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.3: Long-Term Behavior Descriptive Statistics by Income

| | (1) Full Sample | | (2) Less than $50,000 | | (3) More than $50,000 | | Diff. between High and Low |
|---|---|---|---|---|---|---|---|
| | Count | Prop. | Count | Prop. | Count | Prop. | Signif. |
| Emergency fund | 24497 | 0.4164 | 12429 | 0.2616 | 12068 | 0.5877 | *** |
| Has Savings Account | 25012 | 0.7403 | 12670 | 0.5997 | 12342 | 0.8953 | *** |
| Has Non-Retirement Investments | 23030 | 0.3636 | 11126 | 0.1829 | 11904 | 0.5435 | *** |
| Figure Retirement Amount | 19545 | 0.3859 | 10053 | 0.2489 | 9492 | 0.5418 | *** |
| Has Non-Employer Retirement Account | 24260 | 0.2907 | 12357 | 0.1334 | 11903 | 0.4663 | *** |
| Sum of LT Behaviors | 21626 | 2.3414 | 10378 | 1.5700 | 11248 | 3.0994 | *** |
| Observations | 25421 | | 12948 | | 12473 | | |

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.4: Long-Term Financial Behaviors Probit Results

| | (1) Emergency Fund | (2) Savings Account | (3) Non-retirement Investments | (4) Figured Retirement | (5) Non-Employer Retirement |
|---|---|---|---|---|---|
| Male | 0.0172* | -0.0255*** | 0.0085 | -0.0010 | -0.0111 |
| | (0.009) | (0.007) | (0.009) | (0.009) | (0.008) |
| White Alone | -0.0059 | -0.0020 | 0.0504*** | -0.0047 | 0.0496*** |
| | (0.011) | (0.009) | (0.011) | (0.011) | (0.009) |
| Single | -0.0065 | -0.0395*** | 0.0198 | -0.0405*** | -0.0106 |
| | (0.013) | (0.010) | (0.013) | (0.012) | (0.011) |
| Divorced/Separated | -0.0907*** | -0.0667*** | -0.0529*** | -0.0324** | -0.0627*** |
| | (0.013) | (0.012) | (0.013) | (0.013) | (0.011) |
| Widowed/Widower | -0.0535** | -0.0088 | -0.0098 | 0.0097 | 0.0009 |
| | (0.021) | (0.019) | (0.022) | (0.022) | (0.019) |
| Self Employed | 0.0567*** | -0.0255* | 0.0718*** | 0.0053 | 0.0920*** |
| | (0.017) | (0.015) | (0.017) | (0.016) | (0.016) |
| Not in Labor Force | -0.0259** | -0.0789*** | -0.0909*** | -0.0937*** | -0.0635*** |
| | (0.013) | (0.011) | (0.012) | (0.012) | (0.011) |
| Unemployed | -0.0773*** | -0.1374*** | -0.0847*** | -0.0743*** | -0.0385** |
| | (0.018) | (0.015) | (0.018) | (0.017) | (0.016) |
| Retired | 0.0961*** | -0.0246* | 0.0316** | 0.0069 | 0.0446*** |
| | (0.015) | (0.014) | (0.015) | (0.015) | (0.013) |
| Number of Children | -0.0356*** | -0.0126*** | 0.0073 | 0.0101** | -0.0077* |
| | (0.005) | (0.004) | (0.005) | (0.004) | (0.004) |
| 18-24 | -0.1010*** | -0.0201 | -0.1469*** | -0.1767*** | -0.1458*** |
| | (0.022) | (0.020) | (0.019) | (0.019) | (0.015) |
| 25-34 | -0.1752*** | -0.0823*** | -0.1695*** | -0.1210*** | -0.1495*** |
| | (0.017) | (0.019) | (0.016) | (0.018) | (0.012) |
| 35-44 | -0.2191*** | -0.0853*** | -0.1869*** | -0.1422*** | -0.1553*** |
| | (0.016) | (0.019) | (0.015) | (0.017) | (0.012) |
| 45-54 | -0.2000*** | -0.0935*** | -0.1547*** | -0.1248*** | -0.1187*** |
| | (0.015) | (0.017) | (0.015) | (0.015) | (0.012) |
| 55-64 | -0.1305*** | -0.0416*** | -0.0829*** | -0.0364** | -0.0555*** |
| | (0.014) | (0.015) | (0.014) | (0.014) | (0.011) |
| Less than $25k | -0.3409*** | -0.3150*** | -0.3134*** | -0.2254*** | -0.2550*** |
| | (0.012) | (0.015) | (0.010) | (0.013) | (0.009) |
| $25-50k | -0.2399*** | -0.1898*** | -0.2356*** | -0.1518*** | -0.1836*** |
| | (0.011) | (0.014) | (0.010) | (0.011) | (0.008) |

| | | | | | |
|---|---|---|---|---|---|
| $50-75k | -0.1250*** | -0.0679*** | -0.1142*** | -0.0783*** | -0.0974*** |
| | (0.012) | (0.014) | (0.011) | (0.012) | (0.009) |
| $150k+ | 0.1447*** | 0.0675*** | 0.1489*** | 0.0929*** | 0.1042*** |
| | (0.020) | (0.017) | (0.020) | (0.019) | (0.017) |
| Less than high school | -0.1904*** | -0.2321*** | -0.1862*** | -0.1428*** | -0.1792*** |
| | (0.018) | (0.020) | (0.017) | (0.018) | (0.012) |
| High School | -0.1162*** | -0.0976*** | -0.1231*** | -0.0941*** | -0.1236*** |
| | (0.013) | (0.013) | (0.012) | (0.013) | (0.010) |
| Some College | -0.1086*** | -0.0382*** | -0.0978*** | -0.0377*** | -0.1086*** |
| | (0.012) | (0.011) | (0.011) | (0.012) | (0.009) |
| Post Grad Education | -0.0095 | -0.0037 | 0.0207 | 0.0147 | 0.0176 |
| | (0.015) | (0.015) | (0.015) | (0.015) | (0.013) |
| HS Course Only | 0.0381* | 0.0252 | 0.0127 | 0.1124*** | 0.0209 |
| | (0.022) | (0.016) | (0.024) | (0.022) | (0.023) |
| College Course Only | 0.0149 | 0.0013 | 0.0207 | 0.0640*** | 0.0081 |
| | (0.022) | (0.018) | (0.020) | (0.021) | (0.018) |
| Employer Course Only | 0.0250 | 0.0518** | 0.0533** | 0.1349*** | 0.0523** |
| | (0.026) | (0.022) | (0.026) | (0.027) | (0.024) |
| HS & College Course Only | 0.0682*** | 0.0246 | 0.0486* | 0.0481* | 0.0216 |
| | (0.026) | (0.022) | (0.026) | (0.025) | (0.021) |
| HS & Employer Course Only | 0.1275*** | 0.0787*** | 0.1326*** | 0.2471*** | 0.1505*** |
| | (0.033) | (0.022) | (0.036) | (0.032) | (0.036) |
| College & Employer Course Only | 0.0685** | 0.1127*** | 0.0925*** | 0.1903*** | 0.1072*** |
| | (0.027) | (0.018) | (0.026) | (0.027) | (0.026) |
| HS, College, & Employer Course | 0.1513*** | 0.0508** | 0.1668*** | 0.2144*** | 0.1361*** |
| | (0.024) | (0.020) | (0.025) | (0.024) | (0.025) |
| Financial Literacy Score | 0.0183*** | 0.0267*** | 0.0445*** | 0.0451*** | 0.0383*** |
| | (0.004) | (0.003) | (0.004) | (0.003) | (0.003) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .1430 | .1703 | .2016 | .2330 | .2088 |
| Observations | 22178 | 22572 | 20865 | 22858 | 22027 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.5: Long-Term Financial Behaviors Split by Education

| | (1) Emergency Fund | (2) Savings Account | (3) Non-retirement Investments | (4) Figured Retirement | (5) Non-Employer Retirement |
|---|---|---|---|---|---|
| Panel A: Low Education | | | | | |
| HS Course Only | 0.0997*** | 0.0732*** | 0.0612** | 0.1216*** | 0.0467* |
| | (0.029) | (0.028) | (0.028) | (0.029) | (0.024) |
| Employer Course Only | 0.0277 | 0.1695*** | 0.0884 | 0.1585*** | 0.0874* |
| | (0.053) | (0.049) | (0.057) | (0.059) | (0.049) |
| HS & Employer Course Only | 0.1712*** | 0.1539*** | 0.1993*** | 0.2630*** | 0.1660*** |
| | (0.046) | (0.042) | (0.052) | (0.048) | (0.048) |
| Financial Literacy Score | 0.0143*** | 0.0404*** | 0.0437*** | 0.0416*** | 0.0270*** |
| | (0.005) | (0.006) | (0.005) | (0.005) | (0.003) |
| Pseudo $R^2$ | .1598 | .1837 | .1901 | .1168 | .2169 |
| Observations | 7258 | 7361 | 6339 | 7518 | 7173 |
| Panel B: High Education | | | | | |
| HS Course Only | -0.0445 | -0.0143 | -0.0486 | 0.0913*** | -0.0560* |
| | (0.033) | (0.022) | (0.033) | (0.032) | (0.031) |
| College Course Only | 0.0191 | -0.0015 | 0.0006 | 0.0589** | 0.0173 |
| | (0.024) | (0.016) | (0.024) | (0.024) | (0.023) |
| Employer Course Only | 0.0168 | 0.0345 | 0.0343 | 0.1303*** | 0.0439 |
| | (0.033) | (0.023) | (0.033) | (0.033) | (0.032) |
| HS & College Course Only | 0.0638** | 0.0253 | 0.0330 | 0.0435 | 0.0172 |
| | (0.030) | (0.019) | (0.030) | (0.028) | (0.027) |
| HS & Employer Course Only | 0.0843* | 0.0365 | 0.0354 | 0.2182*** | 0.0695 |
| | (0.046) | (0.032) | (0.047) | (0.043) | (0.044) |
| College & Employer Course Only | 0.0694** | 0.0896*** | 0.0908*** | 0.1850*** | 0.1164*** |
| | (0.032) | (0.016) | (0.032) | (0.032) | (0.032) |
| HS, College, & Employer Course | 0.1674*** | 0.0547*** | 0.1585*** | 0.2154*** | 0.1566*** |
| | (0.027) | (0.017) | (0.029) | (0.026) | (0.030) |
| Financial Literacy Score | 0.0178*** | 0.0192*** | 0.0397*** | 0.0411*** | 0.0373*** |
| | (0.005) | (0.003) | (0.005) | (0.005) | (0.005) |
| State Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Pseudo $R^2$ | .1418 | .1375 | .1709 | .1106 | .1948 |
| Observations | 11980 | 12210 | 11585 | 12320 | 11908 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.6: Long-Term Financial Behaviors Split by Income

| | (1) Emergency Fund | (2) Savings Account | (3) Investments | (4) Figured Retirement | (5) Non-Employer Retirement |
|---|---|---|---|---|---|
| Panel A: Low Income | | | | | |
| HS Course Only | 0.0210 | 0.0384 | 0.0250 | 0.0998*** | 0.0150 |
| | (0.024) | (0.026) | (0.024) | (0.028) | (0.021) |
| College Course Only | 0.0260 | -0.0128 | 0.0069 | 0.0681** | 0.0215 |
| | (0.027) | (0.031) | (0.021) | (0.027) | (0.018) |
| Employer Course Only | -0.0174 | 0.0659 | 0.0431 | 0.1432*** | 0.0509 |
| | (0.036) | (0.047) | (0.035) | (0.043) | (0.031) |
| HS & College Course Only | 0.0482 | 0.0244 | 0.0375 | 0.0458 | 0.0141 |
| | (0.033) | (0.039) | (0.029) | (0.033) | (0.020) |
| HS & Employer Course Only | 0.1188*** | 0.1496*** | 0.1395*** | 0.3008*** | 0.1551*** |
| | (0.044) | (0.040) | (0.046) | (0.046) | (0.044) |
| College & Employer Course Only | -0.0228 | 0.1306** | 0.0357 | 0.1719*** | 0.0452 |
| | (0.041) | (0.053) | (0.036) | (0.051) | (0.032) |
| HS, College, & Employer Course | 0.0924** | 0.0802* | 0.1747*** | 0.1595*** | 0.1016*** |
| | (0.040) | (0.044) | (0.041) | (0.043) | (0.035) |
| Financial Literacy Score | 0.0135*** | 0.0334*** | 0.0302*** | 0.0377*** | 0.0212*** |
| | (0.004) | (0.005) | (0.004) | (0.004) | (0.003) |
| Pseudo $R^2$ | .0810 | .1193 | .1077 | .0918 | .1346 |
| Observations | 11118 | 11301 | 9947 | 11499 | 11075 |
| Panel B: High Income | | | | | |
| HS Course Only | 0.0524* | 0.0088 | -0.0142 | 0.1067*** | 0.0181 |
| | (0.031) | (0.014) | (0.034) | (0.030) | (0.036) |
| College Course Only | 0.0060 | 0.0102 | 0.0360 | 0.0510* | -0.0057 |
| | (0.028) | (0.014) | (0.028) | (0.027) | (0.029) |
| Employer Course Only | 0.0444 | 0.0307** | 0.0491 | 0.1149*** | 0.0450 |
| | (0.031) | (0.013) | (0.032) | (0.029) | (0.033) |
| HS & College Course Only | 0.0775** | 0.0153 | 0.0479 | 0.0385 | 0.0286 |
| | (0.032) | (0.016) | (0.033) | (0.031) | (0.035) |
| HS & Employer Course Only | 0.1085*** | 0.0198 | 0.0932** | 0.1758*** | 0.1114** |
| | (0.039) | (0.020) | (0.042) | (0.037) | (0.046) |
| College & Employer Course Only | 0.1030*** | 0.0605*** | 0.1058*** | 0.1776*** | 0.1343*** |
| | (0.028) | (0.008) | (0.030) | (0.028) | (0.032) |
| HS, College, & Employer Course | 0.1553*** | 0.0281** | 0.1414*** | 0.2155*** | 0.1473*** |
| | (0.025) | (0.012) | (0.027) | (0.024) | (0.030) |
| Financial Literacy Score | 0.0174*** | 0.0150*** | 0.0460*** | 0.0454*** | 0.0494*** |
| | (0.005) | (0.002) | (0.005) | (0.005) | (0.005) |
| Pseudo $R^2$ | .1166 | .1006 | .1266 | .0906 | .1456 |
| Observations | 11060 | 11271 | 10918 | 11359 | 10952 |

Standard errors in parentheses; * $p < .1$, ** $p < .05$, *** $p < .01$

Table 6.7: Long-Term Behaviors Summary Table

| | | Emergency Fund | Savings Account | Investments | Figured retirement | Non-employer retirement |
|---|---|---|---|---|---|---|
| Full Sample | HS | + | | | + | |
| | Coll | | | | + | |
| | Empl | | + | + | + | + |
| | HS and Coll | + | | + | + | |
| | HS and Empl | + | + | + | + | + |
| | Coll and Empl | + | + | + | + | + |
| | HS, Coll, Empl | + | + | + | + | + |
| Low Educ. | HS | + | + | + | + | + |
| | Empl | | + | | + | + |
| | HS and Empl | + | + | + | + | + |
| High Educ. | HS | | | | + | - |
| | Coll | | | | + | |
| | Empl | | | | + | |
| | HS and Coll | + | | | | |
| | HS and Empl | + | | | + | |
| | Coll and Empl | + | + | + | + | + |
| | HS, Coll, Empl | + | + | + | + | + |
| Low inc. | HS | | | | + | |
| | Coll | | | | + | |
| | Empl | | | | + | |
| | HS and Coll | | | | | |
| | HS and Empl | + | + | + | + | + |
| | Coll and Empl | | + | | + | |
| | HS, Coll, Empl | + | + | + | + | + |
| High inc. | HS | + | | | + | |
| | Coll | | | | + | |
| | Empl | | + | | + | |
| | HS and Coll | + | | | | |
| | HS and Empl | + | | + | + | + |
| | Coll and Empl | + | + | + | + | + |
| | HS, Coll, Empl | + | + | + | + | + |

# Appendix A: Short-Term Financial Behaviors Split by Age

| | (1) Paying Bills | (2) Has Checking Account | (3) Pays CC in Full |
|---|---|---|---|
| Panel A: 18-24 | | | |
| HS Course Only | 0.0654 | 0.0051 | 0.1022* |
| | (0.040) | (0.028) | (0.057) |
| College Course Only | -0.0592 | 0.0911*** | -0.0887 |
| | (0.047) | (0.035) | (0.071) |
| Employer Course Only | 0.1121 | -0.1550 | -0.1665 |
| | (0.130) | (0.137) | (0.148) |
| HS & College Course Only | -0.0261 | -0.1319* | 0.0417 |
| | (0.060) | (0.079) | (0.080) |
| HS & Employer Course Only | 0.0258 | 0.0503 | 0.1496* |
| | (0.072) | (0.052) | (0.080) |
| College & Employer Course Only | -0.1220 | 0.0007 | -0.1003 |
| | (0.082) | (0.112) | (0.151) |
| HS, College, & Employer Course | 0.1262 | -0.0521 | 0.1316 |
| | (0.098) | (0.104) | (0.084) |
| Financial Literacy Score | 0.0169* | 0.0339*** | -0.0096 |
| | (0.010) | (0.008) | (0.015) |
| Pseudo $R^2$ | .1027 | .1967 | .1059 |
| Observations | 2144 | 2198 | 1159 |
| Panel B: 25-34 | | | |
| HS Course Only | 0.0202 | 0.0069 | 0.0538 |
| | (0.050) | (0.027) | (0.066) |
| College Course Only | 0.0052 | 0.0073 | -0.0780 |
| | (0.040) | (0.026) | (0.056) |
| Employer Course Only | 0.0710 | 0.0214 | 0.0080 |
| | (0.076) | (0.033) | (0.096) |
| HS & College Course Only | -0.0001 | -0.0457 | 0.0820 |
| | (0.047) | (0.045) | (0.058) |
| HS & Employer Course Only | 0.0944 | 0.0369* | 0.1956*** |
| | (0.085) | (0.022) | (0.075) |
| College & Employer Course Only | 0.0112 | 0.0219 | -0.1074 |
| | (0.059) | (0.040) | (0.069) |
| HS, College, & Employer Course | 0.0122 | 0.0472*** | 0.2478*** |
| | (0.054) | (0.018) | (0.050) |
| Financial Literacy Score | 0.0078 | 0.0133*** | -0.0126 |
| | (0.008) | (0.004) | (0.010) |
| Pseudo $R^2$ | .1397 | .2539 | .1177 |

| | | | |
|---|---|---|---|
| Observations | 3733 | 3739 | 2626 |
| Panel C: 35-44 | | | |
| HS Course Only | 0.0186 | 0.0205 | -0.1209* |
| | (0.051) | (0.015) | (0.065) |
| College Course Only | 0.0097 | -0.0145 | -0.0020 |
| | (0.044) | (0.025) | (0.051) |
| Employer Course Only | 0.0122 | 0.0234 | 0.0166 |
| | (0.058) | (0.019) | (0.063) |
| HS & College Course Only | 0.0079 | -0.0285 | 0.0023 |
| | (0.057) | (0.037) | (0.070) |
| HS & Employer Course Only | 0.0301 | -0.1138* | 0.0302 |
| | (0.070) | (0.068) | (0.080) |
| College & Employer Course Only | -0.0118 | -0.0225 | 0.0180 |
| | (0.062) | (0.038) | (0.066) |
| HS, College, & Employer Course | -0.0240 | -0.0177 | 0.0866 |
| | (0.054) | (0.033) | (0.061) |
| Financial Literacy Score | 0.0071 | 0.0137*** | -0.0102 |
| | (0.008) | (0.003) | (0.010) |
| Pseudo $R^2$ | .1195 | .2447 | .0940 |
| Observations | 3717 | 3727 | 2692 |
| Panel D: 45-54 | | | |
| HS Course Only | 0.0314 | -0.0025 | 0.1197** |
| | (0.041) | (0.011) | (0.052) |
| College Course Only | 0.0453 | -0.0042 | -0.0703 |
| | (0.049) | (0.014) | (0.050) |
| Employer Course Only | 0.1069** | 0.0276*** | -0.0164 |
| | (0.054) | (0.004) | (0.058) |
| HS & College Course Only | 0.0278 | 0.0034 | 0.0487 |
| | (0.051) | (0.016) | (0.058) |
| HS & Employer Course Only | 0.0176 | -0.0025 | -0.0805 |
| | (0.068) | (0.020) | (0.070) |
| College & Employer Course Only | 0.0504 | -0.0276 | 0.0143 |
| | (0.054) | (0.027) | (0.057) |
| HS, College, & Employer Course | 0.0222 | 0.0041 | 0.0396 |
| | (0.049) | (0.018) | (0.057) |
| Financial Literacy Score | 0.0024 | 0.0085*** | -0.0031 |
| | (0.007) | (0.002) | (0.009) |
| Pseudo $R^2$ | .1557 | .2800 | .0782 |
| Observations | 4656 | 4584 | 3358 |

| | | | |
|---|---|---|---|
| Panel E: 55-64 | | | |
| HS Course Only | 0.0167 | 0.0063 | -0.0150 |
| | (0.066) | (0.007) | (0.072) |
| College Course Only | 0.0314 | -0.0154 | -0.0388 |
| | (0.052) | (0.016) | (0.056) |
| Employer Course Only | 0.0773 | 0.0121* | -0.0576 |
| | (0.049) | (0.006) | (0.050) |
| HS & College Course Only | 0.0373 | -0.0349 | -0.0425 |
| | (0.068) | (0.030) | (0.069) |
| HS & Employer Course Only | 0.0774 | | 0.0556 |
| | (0.076) | | (0.080) |
| College & Employer Course Only | 0.0415 | -0.0115 | 0.0259 |
| | (0.057) | (0.016) | (0.062) |
| HS, College, & Employer Course | 0.0045 | -0.0032 | 0.0580 |
| | (0.051) | (0.011) | (0.055) |
| Financial Literacy Score | 0.0285*** | 0.0063*** | 0.0478*** |
| | (0.008) | (0.001) | (0.009) |
| Pseudo $R^2$ | .1832 | .2804 | .0986 |
| Observations | 4395 | 4400 | 3451 |
| Panel F: 65+ | | | |
| HS Course Only | -0.0676 | 0.0023 | -0.1033 |
| | (0.073) | (0.002) | (0.065) |
| College Course Only | 0.0418 | | -0.0544 |
| | (0.059) | | (0.060) |
| Employer Course Only | 0.0367 | 0.0015 | -0.0533 |
| | (0.052) | (0.003) | (0.058) |
| HS & College Course Only | -0.0903 | -0.0082 | -0.0074 |
| | (0.075) | (0.015) | (0.070) |
| HS & Employer Course Only | -0.0133 | | -0.0864 |
| | (0.074) | | (0.081) |
| College & Employer Course Only | 0.1488*** | -0.0373 | -0.0017 |
| | (0.048) | (0.030) | (0.058) |
| HS, College, & Employer Course | 0.1211** | -0.0176 | 0.0121 |
| | (0.048) | (0.019) | (0.054) |
| Financial Literacy Score | 0.0224*** | 0.0018** | 0.0226*** |
| | (0.008) | (0.001) | (0.008) |
| Pseudo $R^2$ | .1764 | .3013 | .1036 |
| Observations | 3900 | 2596 | 3462 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p < .01$

# Appendix B: Long-Term Financial Behaviors Split by Age

| | (1) Em. Fund | (2) Savings Acc. | (3) Investments | (4) Fig. Retire | (5) Non-Empl Retir |
|---|---|---|---|---|---|
| Panel A: 18-24 | | | | | |
| HS Course Only | 0.1095*** | 0.0696* | 0.0928** | 0.0697* | 0.0297 |
| | (0.041) | (0.037) | (0.040) | (0.036) | (0.025) |
| College Course Only | 0.0371 | 0.0548 | 0.0532 | 0.0393 | 0.0406 |
| | (0.056) | (0.056) | (0.045) | (0.048) | (0.036) |
| Employer Course Only | -0.0586 | 0.2239*** | 0.2318 | 0.0560 | 0.0125 |
| | (0.111) | (0.075) | (0.158) | (0.114) | (0.082) |
| HS & College Course Only | 0.1769** | 0.0440 | 0.0936 | 0.0019 | 0.0178 |
| | (0.076) | (0.065) | (0.064) | (0.049) | (0.036) |
| HS & Employer Course Only | 0.1402 | 0.1118* | 0.2314** | 0.2537*** | 0.0796 |
| | (0.085) | (0.064) | (0.095) | (0.083) | (0.063) |
| College & Employer Course Only | -0.0424 | 0.1993** | 0.0233 | 0.3202** | 0.2162* |
| | (0.123) | (0.079) | (0.084) | (0.132) | (0.115) |
| HS, College, & Employer Course | 0.4137*** | 0.1874** | 0.2002** | 0.2171** | 0.0937 |
| | (0.072) | (0.084) | (0.100) | (0.086) | (0.070) |
| Financial Literacy Score | 0.0027 | 0.0280*** | 0.0155* | 0.0105 | -0.0004 |
| | (0.010) | (0.010) | (0.008) | (0.008) | (0.005) |
| Pseudo $R^2$ | .1140 | .1401 | .1937 | .1435 | .1905 |
| Observations | 2131 | 2183 | 1830 | 2229 | 2048 |
| Panel B: 25-34 | | | | | |
| HS Course Only | 0.0088 | 0.0390 | 0.0881 | 0.1617*** | 0.0553 |
| | (0.055) | (0.050) | (0.063) | (0.056) | (0.047) |
| College Course Only | 0.0268 | -0.0272 | -0.0075 | 0.0928** | 0.0140 |
| | (0.046) | (0.042) | (0.037) | (0.044) | (0.032) |
| Employer Course Only | -0.1093* | -0.0048 | -0.0193 | 0.0470 | 0.0562 |
| | (0.065) | (0.074) | (0.068) | (0.076) | (0.063) |
| HS & College Course Only | 0.0623 | 0.1066** | 0.0261 | 0.0385 | 0.0295 |
| | (0.051) | (0.052) | (0.047) | (0.051) | (0.035) |
| HS & Employer Course Only | 0.2064*** | 0.0029 | 0.3174*** | 0.2893*** | 0.3212*** |
| | (0.080) | (0.082) | (0.080) | (0.079) | (0.084) |
| College & Employer Course Only | -0.0262 | 0.0834 | 0.0398 | 0.1518** | 0.1581*** |
| | (0.059) | (0.076) | (0.060) | (0.065) | (0.060) |
| HS, College, & Employer Course | 0.2707*** | 0.1574*** | 0.1973*** | 0.2331*** | 0.2055*** |
| | (0.056) | (0.044) | (0.058) | (0.057) | (0.056) |
| Financial Literacy Score | -0.0128 | 0.0270*** | 0.0168** | 0.0311*** | -0.0017 |
| | (0.008) | (0.007) | (0.008) | (0.008) | (0.006) |
| Pseudo R2 | .1461 | .2362 | .1876 | .1164 | .2081 |
| Observations | 3684 | 3731 | 3307 | 3780 | 3601 |

| | | | | | |
|---|---|---|---|---|---|
| Panel C: 35-44 | | | | | |
| HS Course Only | -0.0275 | -0.0010 | -0.0191 | 0.1632*** | 0.1007* |
| | (0.053) | (0.045) | (0.052) | (0.056) | (0.058) |
| College Course Only | 0.0333 | -0.0138 | 0.0140 | 0.1038** | 0.0022 |
| | (0.044) | (0.045) | (0.044) | (0.049) | (0.033) |
| Employer Course Only | -0.0273 | 0.1325*** | 0.0383 | 0.1548** | 0.0498 |
| | (0.052) | (0.036) | (0.056) | (0.062) | (0.051) |
| HS & College Course Only | 0.0117 | -0.0170 | 0.1000* | 0.0641 | 0.0513 |
| | (0.056) | (0.055) | (0.058) | (0.064) | (0.046) |
| HS & Employer Course Only | 0.1122 | 0.1234*** | 0.0655 | 0.1718** | 0.0782 |
| | (0.077) | (0.040) | (0.076) | (0.075) | (0.063) |
| College & Employer Course Only | 0.0973 | 0.0888* | 0.0841 | 0.1137* | 0.0492 |
| | (0.068) | (0.051) | (0.066) | (0.066) | (0.052) |
| HS, College, & Employer Course | 0.0436 | 0.0032 | 0.2220*** | 0.1821*** | 0.1523*** |
| | (0.055) | (0.048) | (0.063) | (0.057) | (0.054) |
| Financial Literacy Score | 0.0243*** | 0.0272*** | 0.0420*** | 0.0483*** | 0.0316*** |
| | (0.008) | (0.007) | (0.008) | (0.008) | (0.007) |
| Pseudo R2 | .1705 | .2284 | .1922 | .1251 | .2222 |
| Observations | 3647 | 3729 | 3418 | 3764 | 3649 |
| Panel D: 45-54 | | | | | |
| HS Course Only | 0.0620 | -0.0011 | 0.0144 | 0.0766* | -0.0424 |
| | (0.045) | (0.033) | (0.044) | (0.045) | (0.038) |
| College Course Only | 0.0416 | 0.0210 | 0.0652 | 0.1079** | 0.1069** |
| | (0.049) | (0.039) | (0.048) | (0.049) | (0.045) |
| Employer Course Only | 0.0347 | 0.0634 | 0.0710 | 0.2213*** | 0.0601 |
| | (0.052) | (0.048) | (0.056) | (0.057) | (0.050) |
| HS & College Course Only | 0.0728 | 0.0169 | 0.0883 | 0.0821 | 0.1064** |
| | (0.055) | (0.052) | (0.055) | (0.055) | (0.048) |
| HS & Employer Course Only | 0.0483 | 0.1587*** | -0.0137 | 0.2965*** | 0.1067 |
| | (0.071) | (0.030) | (0.066) | (0.069) | (0.066) |
| College & Employer Course Only | 0.0650 | 0.1159*** | 0.0885 | 0.1532*** | 0.0488 |
| | (0.053) | (0.036) | (0.058) | (0.056) | (0.049) |
| HS, College, & Employer Course | 0.0818 | 0.0167 | 0.1042* | 0.1205** | 0.0789 |
| | (0.055) | (0.052) | (0.054) | (0.055) | (0.048) |
| Financial Literacy Score | 0.0151** | 0.0346*** | 0.0538*** | 0.0572*** | 0.0491*** |
| | (0.008) | (0.006) | (0.008) | (0.008) | (0.007) |
| Pseudo R2 | .1474 | .2176 | .2191 | .1462 | .2229 |
| Observations | 4585 | 4659 | 4349 | 4711 | 4560 |

| | | | | | |
|---|---|---|---|---|---|
| Panel E: 55-64 | | | | | |
| HS Course Only | 0.0454 | -0.0212 | -0.0678 | 0.0549 | -0.0046 |
| | (0.062) | (0.046) | (0.063) | (0.066) | (0.061) |
| College Course Only | -0.0311 | -0.0513 | 0.0694 | 0.0116 | -0.0821** |
| | (0.052) | (0.046) | (0.050) | (0.051) | (0.040) |
| Employer Course Only | 0.1665*** | 0.0026 | 0.0676 | 0.1566*** | 0.0361 |
| | (0.052) | (0.042) | (0.054) | (0.046) | (0.047) |
| HS & College Course Only | 0.1292** | -0.0419 | 0.0307 | 0.0930 | -0.0005 |
| | (0.064) | (0.056) | (0.065) | (0.064) | (0.065) |
| HS & Employer Course Only | 0.1418* | 0.0339 | 0.0649 | 0.1931** | 0.0567 |
| | (0.076) | (0.047) | (0.075) | (0.076) | (0.075) |
| College & Employer Course Only | 0.0961* | 0.1034*** | 0.0951* | 0.2679*** | 0.1125** |
| | (0.053) | (0.028) | (0.056) | (0.049) | (0.055) |
| HS, College, & Employer Course | 0.0927* | -0.0476 | 0.1282** | 0.2173*** | 0.0557 |
| | (0.052) | (0.046) | (0.053) | (0.043) | (0.051) |
| Financial Literacy Score | 0.0287*** | 0.0190*** | 0.0527*** | 0.0578*** | 0.0717*** |
| | (0.008) | (0.006) | (0.009) | (0.008) | (0.008) |
| Pseudo R2 | .1870 | .2180 | .2113 | .1581 | .2431 |
| Observations | 4315 | 4385 | 4178 | 4436 | 4315 |
| Panel F: 65+ | | | | | |
| HS Course Only | -0.0176 | 0.0444 | -0.1542** | 0.1885*** | -0.1323* |
| | (0.067) | (0.027) | (0.078) | (0.056) | (0.070) |
| College Course Only | 0.0181 | 0.0188 | 0.0064 | 0.0689 | 0.0176 |
| | (0.056) | (0.030) | (0.066) | (0.054) | (0.059) |
| Employer Course Only | 0.0099 | -0.0002 | 0.0201 | 0.0702 | 0.0111 |
| | (0.054) | (0.032) | (0.056) | (0.052) | (0.059) |
| HS & College Course Only | 0.0222 | 0.0268 | -0.0468 | 0.0429 | -0.0972 |
| | (0.069) | (0.033) | (0.070) | (0.064) | (0.069) |
| HS & Employer Course Only | 0.0836 | 0.0568** | 0.0618 | 0.1682*** | 0.0416 |
| | (0.062) | (0.025) | (0.075) | (0.062) | (0.080) |
| College & Employer Course Only | 0.1685*** | 0.0799*** | 0.1715*** | 0.2266*** | 0.1256* |
| | (0.041) | (0.017) | (0.058) | (0.051) | (0.068) |
| HS, College, & Employer Course | 0.1159*** | 0.0542** | 0.1135** | 0.2896*** | 0.1510** |
| | (0.041) | (0.025) | (0.055) | (0.037) | (0.061) |
| Financial Literacy Score | 0.0478*** | 0.0196*** | 0.0796*** | 0.0631*** | 0.0908*** |
| | (0.008) | (0.005) | (0.009) | (0.009) | (0.010) |
| Pseudo R2 | .2115 | .2051 | .2228 | .1296 | .2247 |
| Observations | 3816 | 3885 | 3783 | 3938 | 3824 |

Standard errors in parentheses
* $p < .1$, ** $p < .05$, *** $p <$ .